HELSINKI SCHOOL OF ECONOMICS (HSE)
Department of Accounting and Finance

THE CONTRIBUTION OF SALARY, OWNERSHIP AND GENDER OF MANAGAR TO MUTUAL FUND PERFORMANCE IN FINLAND

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ABSTRACT
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OBJECTIVES OF THE STUDY

The objective of this study is to find out whether knowing the fund manager's salary and ownership stake in the fund they manage would be useful information for a Finnish investor when trying to predict the future performance of the fund. I investigate whether higher lagged ownership or salary is associated with better future performance and try to find out if there are some common factors, which explain the amount of ownership and level of salary. Moreover it is examined whether there are differences in performance between male and female managers and whether the gender of manager affects the popularity of the fund.

DATA AND METHODOLOGY

In this Thesis I have used the unique managerial income data gathered from Veropörssi magazines as well as managerial ownership and performance data gathered from reports of mutual fund companies. The raw data consists of 344 Finnish registered mutual funds. Multiple regression models have been used to test the explanatory power of lagged salary, lagged ownership and gender to performance. Performance is measured here by using Sharpe's ratio. Moreover it is tested whether mentioned variables or some control variables can be used to explain the level of volatility or net inflows.

RESULTS

According to results there do not seem to be evidence that future performance could be estimated neither with manager's income nor gender. However, there is some evidence that managers with personal investments in the funds they manage, perform better. Thus personal ownership can be used as one factor while choosing mutual funds to invest. Moreover net inflows are higher in funds associated with managerial ownership which suggests that investors prefer these funds at least in some extent. This Thesis includes also few interesting co-findings. Firstly, Finnish investors do not seem to disdain female fund managers even thought such evidence exists from U.S. markets. Secondly, female managers and managers associated with personal ownership in funds under management have lower volatilities. Thirdly, overall fees for investor have a strong positive correlation with manager's earned income, meaning that managerial income could be one of the major cost drivers. Fourthly, Finnish mutual fund companies dismiss managers with somewhat different arguments than their American counterparts.

KEYWORDS

Mutual fund markets, mutual fund performance, portfolio manager, fund management, salary, ownership, gender, net inflows, Finnish registered mutual funds, regression model.

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TUTKIMUKSEN TAVOITTEET

Tämän tutkielman tavoitteena on selvittää, ovatko salkunhoitajan palkka ja henkilökohtainen omistusosuus hallinnoidussa rahastossa hyödyllistä informaatiota sijoittajalle kun rahaston tulevaa menestystä pyritään ennakoimaan. Tutkin pystytäänkö aikaisempi salkunhoitajan omistusosuuden tai palkan suuruus yhdistämään parempaan menestykseen tulevaisuudessa ja onko olemassa yleisiä tekijöitä, jotka voisivat selittää salkunhoitajan palkan tai henkilökohtaisen omistuksen tasoa. Tämän ohella tutkin onko mies- ja naissalkunhoitajien menestyksessä eroa, sekä vaikuttaako salkunhoitajan sukupuoli rahaston suosioon sijoittajien keskuudessa.

TUTKIMUSAINEISTO JA –MENETELMÄT

Tutkielmassa on käytetty Veropörssi lehtien tarjoamaa ainutlaatuista palkkatieto-dataa, sekä rahastoyhtiöiden raporteista löytyvää salkunhoitajien omistusosuuksia ja rahastojen menestystä koskevia tietoja. Raakadata koostuu 344 Suomeen rekisteröidystä sijoitusrahastosta. Työssä on käytetty useita eri regressiomalleja, jotta salkunhoitajan palkan, omistusosuuden ja sukupuolen selitysastetta rahaston menestykseen on saatu tutkittua. Rahastojen menestystä on mitattu Sharpen luvulla. Lisäksi työssä on tutkittu mainittujen muuttujien, sekä muutamien kontrollimuuttujien mahdollista kykyä selittää rahastoon kohdistuvaa volatiliteettia tai nettokassavirtaa.

TULOKSET

Tulosten valossa ei näytä olevan todisteita siitä, että rahaston tulevaa menestystä voitaisiin arvioida joko salkun hoitajan palkan tai sukupuolen perusteella. Tästä huolimatta tulokset antavat jonkinasteista näyttöä siitä, että salkunhoitajat, joilla on henkilökohtaisia varoja sijoitettuna heidän itse hallinnoimiinsa rahastoihin, menestyisivät paremmin. Näin ollen salkunhoitajan henkilökohtaisia omistuksia voitaisiin pitää yhtenä valintakriteerinä sijoitusrahastoa valittaessa. Lisäksi nettokassavirrat ovet suurempia rahastoissa, joissa salkunhoitajalla on henkilökohtaisia omistuksia, josta voisi päätellä sijoittajien suosivan kyseisiä rahastoja ainakin jossakin määrin. Tutkielma toi esiin myös muutamia kiinnostavia lisähavaintoja. Ensinnäkin, suomalaiset sijoittajat eivät näytä syrjivän naissalkunhoitajia, vaikka kyseisenlaista näyttöä onkin Yhdysvaltojen markkinoilta. Toiseksi, naissalkunhoitajat ja rahastot joissa salkunhoitajalla on henkilökohtaisia omistuksia, voidaan yhdistää alempaan volatiliteettiin. Kolmanneksi, rahastosijoittajaan kohdistuvat kokonaiskustannukset korreloivat vahvasti ja positiivisesti salkunhoitajan ansiotulojen kanssa. Tämä tarkoittaa, että salkunhoitajan palkka saattaa olla yksi merkittäviä sijoittajaan kohdistuvien kustannusten ajureita. Neljänneksi, suomalaiset rahastoyhtiöt tuntuvat irtisanovan salkunhoitajia jonkinverran erilaisin perustein kuin amerikkalaiset rahastoyhtiöt.

ASIASANAT

Rahastomarkkinat, rahaston menestys, salkunhoitaja, rahaston hallinta, ansiotulo, omistusosuus, sukupuoli, nettokassavirrat, Suomeen rekisteröidyt sijoitusrahastot, regressiomalli.

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1. Introduction

This chapter includes some background for this study as well as my personal motivation while choosing the subject. Chapter defines the most important concepts, provides essential background information related to the mutual fund market, and explains the research questions. In the end of this chapter I have introduced the content and structure of this study.

1.1. Background and motivation

In Finland, all mutual fund managers belong to insiders according to Finnish law. In practice, this means that their ownership in the funds they manage is public information and anyone, who is interested in the ownership data, must easily get it from the fund company. We use this information to investigate whether fund managers, who own a larger stake in the funds they manage perform better, and to explore the determinants of managerial ownership.

During the past years a common trend in the mutual fund industry has been the increased regulation of mutual fund companies and the amount of information, which the companies must disclose. Also in Finland the mutual fund law was renewed in 2005, and for example the definition of insiders became much broader. However, when it comes to disclosing information, the Americans are a step further. At the beginning of March 2005, all U.S. mutual fund managers have been required to disclose how much of their personal wealth is invested in the funds they manage. This information is published in the fund's Statement of Additional Information and is available to investors on request. In Finland, the ownership information has already many years been public but it does not have to be disclosed in the reports and is thus not conveniently available to investors.

In the U.S, the new regulation was subject to a broad debate[1]. There were a lot of discussion about whether it is useful for an investor to know the manager's stake in the fund or does the information only tell the investor whether the fund makes sense for the manager's personal portfolio. However, according to SEC[2]: "ownership provides a direct indication of manager's

[1] See for example "Industry Divided over new rules", Eric Uhlfelder, Financial Times, Sep 12, 2005
[2] SEC rule S7-12-04, Disclosure regarding Portfolio Managers of Registered Management

alignment with the interests of shareholders", and thus the new regulation is implemented to improve the transparency of the industry.

In response to the new regulation, Servaes et al. (2006) studied 1,406 U.S mutual funds and found that future risk adjusted performance is positively related to managerial ownership. Since their findings reached the public, the conversation has remained active. One question is for example that if ownership is correlated with better performance, why so few fund management companies mandate their managers to own some of the fund.

In addition to the finding that future performance relates to managerial ownership, Servaes et al. (2006) were also able to find some factors, which determine the amount of ownership. They found that managerial ownership is higher in funds with better past performance, lower front-end loads, smaller size and where the manager has been in charge for a longer period of time. Since these factors have statistically significant correlation coefficients in relation to future risk adjusted performance, their results support the idea that manager's ownership in the fund they manage is useful information to investors, when they try to predict the future performance of the fund.

There were also some significant drawbacks in the data available to Servaes et al. (2006). For example they did not know the exact amount of ownership the managers have, but only a raw range in which the ownership falls. These ranges of ownership amount were $0, $1-$10,000, $10,001-$50,000, $50,001-$100,000, $100,001-$500,000, $500,001-$1,000,000 or above $1,000,000. In case of funds, which have multiple managers, the data was of course even more inaccurate. Moreover, they didn't know whether the managers, who managed the fund at the beginning of the year, were still in charge at the end but had to estimate the amount of managerial change. Since we have both the exact amount of ownership and information about managerial changes available, it will be interesting to see whether we still end up with similar results.

At the same time, I try to study, whether the annual salary affects a fund manager's performance. This is a very interesting area, because to my knowledge, it has not been studied earlier. The biggest reason for this is surely that annual income statistics of people are not public data in most countries. In Finland it still is, and that gives me a benefit compared to other foreign researchers that are interested in the same subject. In future it will be very

difficult to implement a similar study even in Finland, because according a company called Satamedia, the annual income information of people will no longer be public information after this year. Satamedia is the company that publishes Veropörssi, a document that includes income information of Finnish people. According their statement EU forbids continuing to publish this document.

There are a vast amount of studies about top management bonuses and their effect to company performance. Still, it is quite surprising, that there is so scarcely studies available about the level of base salary and performance. Moreover none of the studies in this field even study managers (e.g. Paarsch and Schierer, 1995). In a normal company, this may not be an interesting subject. Firstly, the performance of normal middle management is relatively difficult to measure. Secondly, even if there is way to measure performance, it is hard to say whether the good or bad performance is causal or consequence. In other words, whether good performer work hard because of high salary, or whether the high salary have attracted good people in this task.

When we think about portfolio managers, studying the relationship between fund performance and manager is more essential. First of all, measuring performance is very straight forward: we just need to look at the risk adjusted return of mutual fund under management. The second problem, separating causal and consequence still exist in some extent. However, we can try to solve this problem by investigating whether the raised salary of portfolio manager leads to high performance in the following year. At the same year namely, higher salary could be associated with good performance in some extent, because considerable portion of fund manager's salary consists of bonuses. Actually, performance- based bonuses can comprise even 50% of managers' annual salaries, according one article ("Not only for money", Helena Ranta-Aho, Helsingin Sanomat, Oct 1, 2006). This kind of investigation between salary and performance makes more sense among portfolio managers, compared to managers in other industries, also because salaries of portfolio managers can change relatively fast compared to most industries, even if the hierarchy level remains the same. Moreover, this question is crucial for mutual fund investor. This is because fund manager's salary surely affects the fees of fund, either directly or indirectly. Thus rational investor should not keep money in funds where salary of fund manager is high, if the performance is only mediocre or even below that. In those cases high salary increase the fees without rational reason. Rational reason in this case

would be superior performance, which would mean that the manager really deserves the high salary.

Chevalier and Ellison (1999) note that the job of mutual fund manager is to gather and analyze information in nearly efficient market. They suggest that certain manager characteristics may be associated with better performance. They also conclude that such arguments would be illogical if financial markets are perfect. However, they argue that their notion is completely logical in the world of efficient markets. From their opinion, being a better portfolio manager than someone else is the same if you say that some lawyers are better than others. Thus they argue that different people can process, understand and use the same information better or worse.

It is interesting to see, whether the statement of Chevalier and Ellison (1999) is true in Finnish markets. Most mutual fund studies made in Finnish markets (e.g. Korkeamäki and Smythe, 2004) have concluded that expensive funds perform worse on average. This is in line with the theory that higher costs leads to lower net returns, expecting highly efficient markets and on average similar gross returns before expenses for investor. Thus higher salary could be one factor that increases costs leading to weaker performance. Nevertheless, salary of fund manager is only one of the many variables that define the overall expenses for investor. In spite of which side is correct here, it is totally unclear, what could be the result of relationship between performance and manager's salary?

In this study, we also try to figure out, if there are differences between male and female managers. This is interesting subject as well, because to my knowledge there are no studies from this field in Finland. Internationally differences between male and female investment behaviour is widely studied (e.g. Atkinson et al., 2003). Still, the results vary widely and researchers have not agreed about their statements. Many of these studies state that only difference is the more conservative investment strategy of females (e.g. Powell and Ansic, 1997), some even argue that females achieve better results than males (e.g. Barber and Odean, 2001). Moreover very popular argument, possibly even the most popular argument have been, that investors disdain female managers because they are stereotyped to be less able financial decision makers.

Considering this study, the widely recognised disdain of female managers makes this field even more attractive to study in Finland. Reason for this is the high level of equality between the genders. This can also be seen from The *Global Gender Gap Report 2007*, published by World Economic Forum. Ranking can be seen in Table 1 below.

Table 1. Top 10 countries of Global Gender Gap Index
This table documents the 10 countries with highest rate of equality between males and females at the end of year 2007. The data is gathered from World Economic Forum's annual *Global Gender Gap Report*. Scale in this index is 0 to 1. 1 = perfect equality, 0 = perfect inequality.

Rank	Country	Score
1	Sweden	0.814
2	Norway	0.805
3	**Finland**	**0.804**
4	Iceland	0.783
5	New Zealand	0.764
6	Philippines	0.762
7	Germany	0.761
8	Denmark	0.751
9	Ireland	0.745
10	Spain	0.744

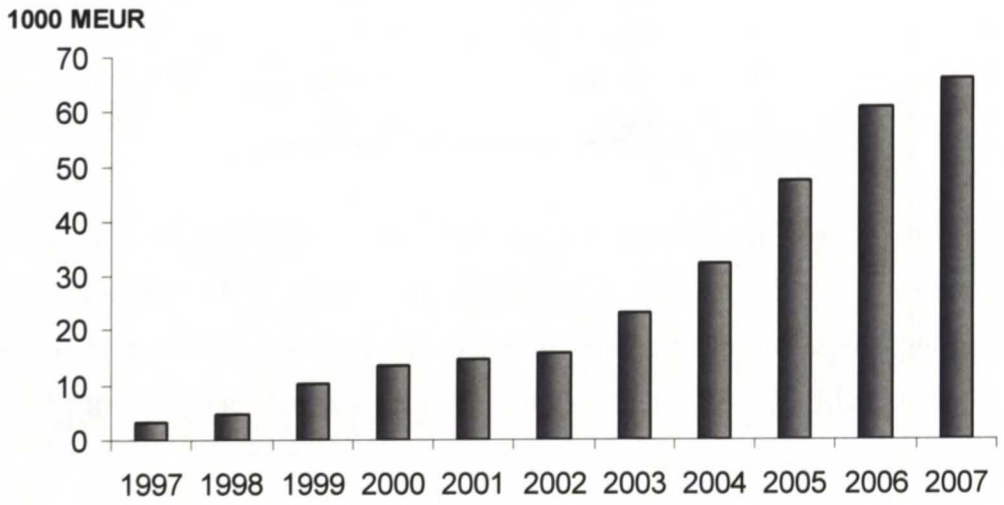
From the table above we can see, that equality gap between males and females in Finland is the third lowest in the world. The rate of equality is higher only in Sweden and Norway. Because of this high level of equality, it is possible that investors do not disdain female managers in Finland, and thus the cash inflows into female managed funds may not be lower compared to male managed funds.

1.2. Finnish mutual fund markets and role of portfolio managers

Mutual funds were established rather late in Finland compared to other developed countries such as major EU countries or United States. It was not until the year 1987 when banks introduced the first mutual funds after the formation of the legal framework for mutual funds. However, the industry did not grow before latter 1990's. Those days the boom in the stock market was also reflected in the mutual fund sector. Moreover declining interest rates, the change in the tax treatment of deposits and increase in voluntary insurance savings shifted

Finnish households' capital into mutual funds. A large proportion of savings associated with voluntary life and pension insurance was invested in the markets via mutual funds. Change in legislation allowed also insurance companies to establish mutual fund management companies, and they soon began to market their own mutual funds among their customers. After 1990's have the assets invested, as well as the number of mutual funds and investors increased rapidly. The market is expected to grow further as more investors become aware of the mutual fund services. Figure 1 below presents the growth in net asset value of Finnish registered mutual funds during the period from 1997 to 2007. During that period, assets under management have increased from 3.1 billion euros to 66 billion euros according to the mutual fund reports of Finnish Association of Mutual Funds.

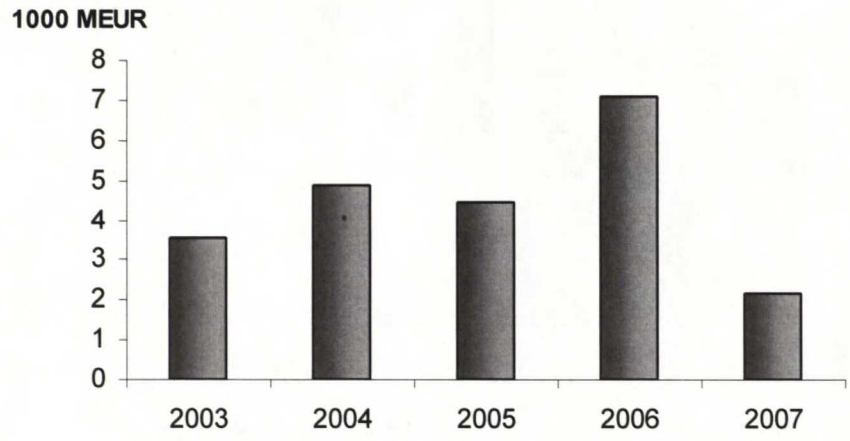
Figure 1. Growth in net asset value of Finnish registered mutual funds
This figure represents the development of net asset value of Finnish registered mutual funds during years 1997 – 2007. Results are represented in billion euros. The data is gathered from the monthly market reports of Rahoitustarkastus.



The exponential growth of assets under management in Finnish registered mutual funds is partly driven by new investments to mutual fund industry, and partly by increased value of fund investments. Actually, during recent years on average about half of the increased total asset value is caused by net asset inflows. This can be seen from Figure 2. As one can see, during the year 2007 both net asset inflows and increase in total assets under management are substantially smaller than previous years. Perhaps this reflects the plummeting in OMX Helsinki stock exchange in the end of year 2007. Namely, this drop decreased the value of

investments, but also net inflows of capital. This can also be seen from monthly mutual fund reports of Sijoitustutkimus Oy. Thus it seems that investors behave more carefully after drop.

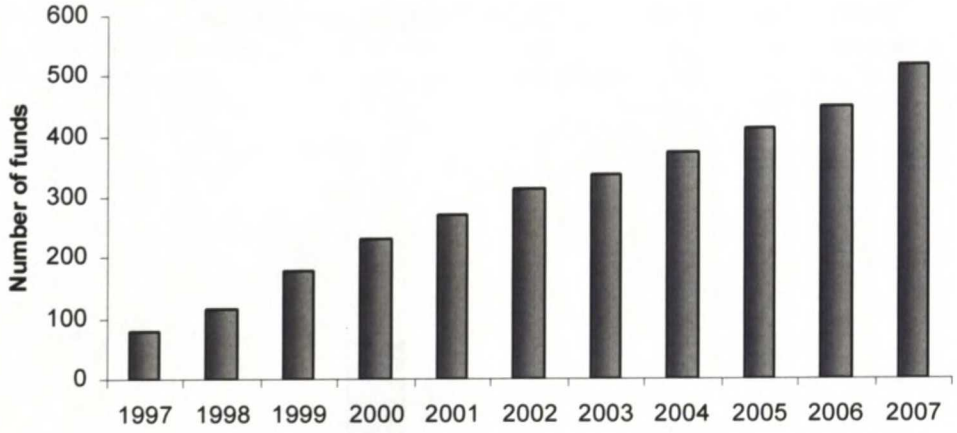
Figure 2. Net asset inflows in Finnish registered mutual funds
This figure represents the development of net asset inflows of Finnish registered mutual funds during years 2003 – 2007. Results are represented in billion euros. The data is gathered from the monthly market reports of Rahoitustarkastus.



After year 2007, asset value in Finnish registered mutual funds has already decreased almost 10 billions, partly because of decrease in value but in larger extent because investors are drawing their money out of the funds (Kauppalehti 10.03.2008). Especially stock funds have been suffering high negative inflows, which mean that investors are looking less risky alternatives in current market situation. This kind of distrust toward markets is mostly due debt crises in U.S. caused by collapse in real estate markets and fear of recession. Future will show whether negative inflows in Finnish mutual fund markets continue.

In addition to tremendous growth in assets under management in last decade, the number of mutual funds in Finnish market has also increased significantly. Figure 3 illustrates that the number of funds has grown from 78 funds in the year 1997 to 516 funds at the end of 2007. However, if all the mutual funds marketed in the Finnish financial market are taken into consideration, the total number of funds would be considerably higher. This is because many of the funds are under foreign registry.

Figure 3. Number of Finnish registered mutual funds during 1997 – 2007
This figure represents the growth of the number of Finnish registered mutual funds during years 1997 – 2007. The data is gathered from the monthly fund reports of Sijoitustutkimus Oy.



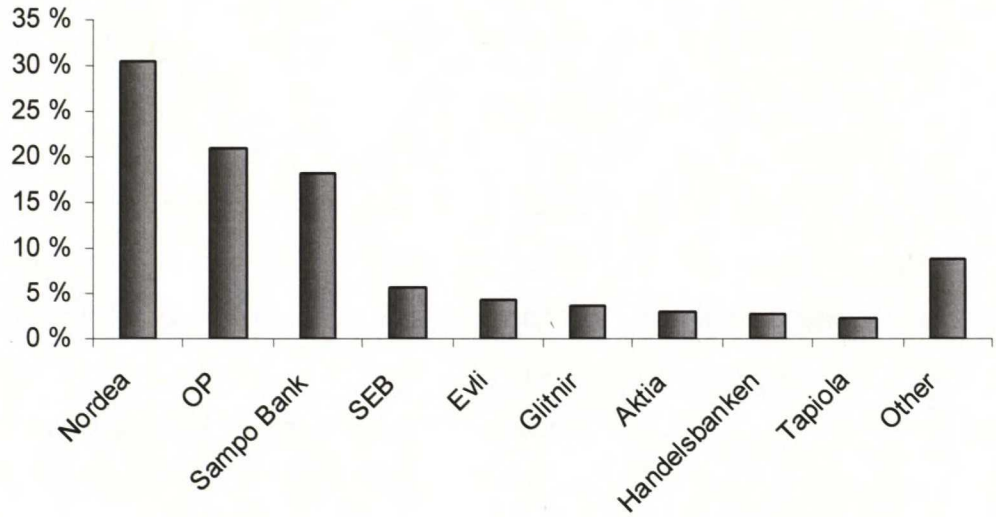
Since last 10 years, product development has been intense. Hedge funds, funds-of-funds and especially index funds, among other, have established an evident foothold in the Finnish market. Product development has also focused on mutual fund fee structures. For example, the use of performance based compensation in the form of incentive fees has increased among actively managed funds. The first fund with incentive fee in Finnish fund markets were Seligson's Phalanx that was established on December 1997.

Many Finnish newspapers (e.g. Helsingin Sanomat, Kauppalehti, Taloussanomat etc.) publish nowadays mutual fund reviews on a weekly basis. Increased attention by the media is followed with growing investments to mutual funds by private investors. Mutual fund market is not anymore a playground for experienced investors but a potential option for private person to invest his or her wealth.

Asset management companies offer funds that invest in all over the world. There are purely domestic funds, but most funds invest in foreign countries. There are funds investing in Nordic countries, Europe, Globally, Japan, Asia, Pacific Rim, emerging markets, North America, South America, and now one that invest even in Africa. This fund investing in Africa is FIM's Sahara fund, which is first of a kind in Finland. As one can realize, variety of different kind of funds is enormous. Since funds have exponentially increased their customer base, fund companies have increasingly attempted to differentiate their services by specializing in certain sectors or more specified geographic areas (Chen et al., 2000). At the moment, the Finnish

market is already relatively competitive, but it still has potential to grow. Reasons for that kind of forecasting are firstly the great amount of money still lying in Finnish bank accounts and secondly the investors' awareness of mutual funds is gradually increasing. During recent years, the market has been dominated by major banks that tend to attract the biggest share of the in-flown money even thought they have higher costs and they perform poorly compared to non-bank managed funds (Knuutila, Puttonen and Smythe, 2006). Market shares of mutual fund distributors in Finland can be seen from Figure 4. This figure reveals that three biggest distributors, Nordea Bank, OP and Sampo Bank, cover approximately 70% of the markets. Thus Finnish mutual fund markets are not only bank dominated, they are also very strongly concentrated around few major players.

Figure 4. Market shares of mutual fund distributors in Finland
This figure reveals market shares measured in percentage of all mutual fund asset value for nine biggest mutual fund distributors in Finland. Shares of smaller distributors are bundled in the category "other". The data represents the market situation at the end of year 2007. The data is gathered from monthly market report of Rahoitustarkastus.



Mutual fund managers play a major role in the markets. A significant portion of mutual fund capital is actively managed by money managers who presumably rely on superior security selection skills to outperform passive strategies. Although investors seem to trust the ability of these mutual fund managers to invest their savings, academics have repeatedly questioned the ability of funds to systematically pick underpriced assets. Starting with Jensen (1968), most studies claim that the net return provided by average actively managed fund is inferior to comparable passive benchmark. Still, some researchers have fate in portfolio managers. For

example Wermers (2000) concluded that mutual fund managers have ability to choose stocks that outperform the benchmarks before fees are deducted. Especially he wants to stress existence of few "star managers" with their reputation for amazing stock picking skills. Perhaps, the most striking example of this is Peter Lynch who run Fidelity Magellan fund from 1977 to 1990, earning his investors 2700 percent returns over thirteen years. Whether managers are skilful or not, there is evidence from U.S. markets (e.g. Daniel et al., 1997) that investors appear to devote resources and choose fund managers according their past performance, even thought future performance appears to be relatively unrelated to past performance. Nevertheless, this effect is surprisingly much weaker in Finnish markets, expectably because of mentioned bank dominance (Puttonen and Smythe, 2006).

Few of the funds in the market are managed by a group of managers, but most funds have only one responsible portfolio manager. At the end of year 2007 the sum of fund managers in Finnish registered mutual funds amounted to 331. Total sum of Finnish registered funds is 516, which clearly means that many of the managers have more than one fund to manage. At the end of year 2007, 28% of the managers had more than one fund. The managers that had most funds were Jari Järvinen and Petri Kovalainen. They both were managing 6 separate funds.

The role of fund manager itself is responsible and important. They are responsible for implementing a consistent investment strategy that reflects the goals and objectives of the fund. Normally, fund managers monitor market and economic trends and analyse securities in order to make informed investment decisions. Fund manager is also the individual who is responsible for the performance of the fund, which in fact is the mandate – to ensure the fund performs. Some management companies give free hands to their fund managers. This is possible even if manager's investment style (e.g. huge sectoral bets) seems to be relatively aggressive. On the other hand, some management companies follow a strong, process-driven investment style and the fund manager's role is to perform within the parameters defined by company. Whether, managers' hands are free or not, in practice they are forced to operate within some limits. This is because in marketing a fund, fund companies have in some degree promised investors a particular management style. Thus customers make their portfolio allocation choices according these promises and they judge the managers not only according their performance, but partly also according made portfolio decisions (Chevallier and Ellison, 1999).

Funds can be divided to single-manager funds and multiple-manager funds. Single-manager funds offer the services of one manager with his or her own management style and track record. Multiple-manager funds, usually fund-of-funds, are investment pools that hold shares in a number of single-manager funds and charge a fee for selecting or providing access to those funds. The role of fund-of-funds is thus not only to exploit managers with different abilities. It also provides smaller investors access to major single-manager funds that otherwise might be out of the reach for small investors because of high minimum investment requirements. Conversely, fund-of-fund is an intermediary that provides investment capital for those managers that have lack of capital in their funds. Nevertheless, fund-of-funds have usually higher fees, because of so called double structure. This means that normal management fee is charged in fund-of fund, but also in the funds that this fund-of-fund invests. This is an obvious problem from investor's point of view.

Because funds may retain more than one manager and managers may work for more than one fund, a fund manager's career is best characterized by a time series of annual engagements by one or more funds. Even when fund closes or drops a manager, that manager may continue to work in the industry as a manager of another fund. Survival in the industry means retaining at least one engagement. In the analysis, we take into consideration each year all managers that have at least this one engagement.

For mutual fund managers, career concerns play a significant role in their decision about risk (Chevalier and Ellison, 1997). They show that fund managers are frequently changed and they frequently re-appear in other funds. Still, manager that got terminated because of bad performance hardly appear in other funds in the future. Thus the risks they choose for their fund appear to impact their future ability to secure employment in the fund management industry. This means that although there is low risk of being terminated because of poor performance, there are huge reputational costs if termination is fulfilled. According Chevalier and Ellison (1997), these are the reasons why managers require higher performance based bonuses when risk of failure is high.

The reason why fund managers are considered as insiders is obvious and well argued. In a similar manner as corporate executives, portfolio managers have an access to the inside information relating to portfolios they manage. In particular, constraints in the fund's

investment policy are one particular category of this kind of information. In their research "Why constrain your mutual fund manager?" Almazan et al. (2004) study the form, adoption rates and economic rational for various mutual fund investment restrictions and find that such constraints are widespread and restrict the investment policy in various ways. If the portfolio manager believes that the restrictions negatively affect the fund's possibilities to generate competitive returns in the future, he or she may not be so willing invest in the fund.

In addition to inside information, portfolio managers certainly have a more sophisticated view on the target industry and country of their portfolio as a whole than the average investor has. For both of the above reasons, the managers can be assumed to invest in their fund only, when they expect it to do well. Again, while we can not distinguish between the incentive and superior knowledge approach, from the potential investor's perspective the approaches are equivalent.

1.3. Research problem

By using a unique data set of Finnish mutual funds, fund managers, and their salaries, the goal of this study is to find out whether knowing the manager's salary and ownership stake in the fund they manage would be useful information for a Finnish investor when trying to predict the future performance of the fund. I investigate whether higher ownership or salary is associated with better future performance and try to find out if there are some common factors, which explain the amount of ownership and level of salary. Moreover I examine whether there are differences in performance between male and female managers and whether the gender of manager affects the popularity of the fund.

1.4. Main Findings

Main results were quite similar with my expectations and previous studies made in United States. According regression results, performance can not be predicted by looking at fund manager's salary or gender. Managerial ownership has positive effect to performance at 10% significance level. There is similar but somewhat stronger evidence about this positive

relationship from U.S. markets. However, evidence from U.S. has been gathered with more inaccurate data.

In addition to my actual research questions, I made some interesting co-findings. Firstly, Finnish investors do not seem to disdain female fund managers even thought such evidence exists from U.S. markets. Secondly, female managers and managers associated with personal ownership in funds under management have lower volatilities. Thus these managers aspire to avoid risks in some extent. Thirdly, overall fees for investor have a strong positive correlation with manager's earned income, meaning that managerial income could be one of the major cost drivers. Fourthly, Finnish mutual fund companies dismiss managers with somewhat different arguments than their American counterparts. All these and additional findings are more detailed represented in Result Section of this thesis.

1.5. Structure of study

The structure of this study is as follows. Chapter 2 provides an overview of related studies from the fields that have contributions in this study. Chapter 3 defines the hypothesis that I use. Chapter 4 discusses the data, its properties and including also some descriptive statistics. Used methodology is introduced in chapter 5. Chapter 6 presents empirical results. Finally, chapter 7 concludes the study and gives suggestion for further research.

2. Literature review

This chapter discusses about the earlier studies and findings related to this study. First, I represent the literature and findings related to incentives or their effects. After that I discuss about the studies that concentrate to differences between male and female investors as well as fund managers.

2.1. Effect of higher salary and incentives

According to previous studies made in United States (e.g. Farnsworth and Tailor, 2004), there are at least two primary mechanisms, which provide portfolio managers with incentives to perform better. Firstly, part of their salary may consist of bonuses, which in turn partly depend on the performance of the fund. Secondly, badly performing manager may be dismissed. In theory literature, threat of dismissal and its impact to managers' risk taking was originally presented by Fama (1980). Later especially Brown et al. (2001) wanted to stress the importance of this threat of bad performance. They argue that incentives of bonuses can only in rare cases be attractive enough for managers to risk their jobs because of them. Moreover they found that once fund manager is dismissed, it is very unlike that he or she finds a new fund to manage. Thus dismissal from one fund most often means losing the opportunities to work in the whole industry. However, there seems to be some evidence that both upside and downside incentives should affect the behaviour of the fund manager (e.g. Chevalier and Ellison, 1997). Actually, performance based bonuses seem to lead on average better performance in U.S. markets, and threat of manager dismissal seems to cause risk avoidance among the worst managers (Brown et al., 2001). Moreover Elton et al. (2003) strongly argue that effort of manager is higher in funds with strong incentives. Closely associated with this is the argument that the best managers will gravitate towards funds that have strong incentives since they can make more money by managing such funds.

Fund manager's personal ownership in the fund under the management can also be seen as one form of incentive. The idea underlying the relation between portfolio manager ownership and the future performance of the fund is analogous to the relation between firm performance and insider ownership at the corporate level. Hence mutual fund companies can use fund

manager's ownership as a vehicle to avoid same agency problems that occur between CEO's and owners of company in any business (Chevalier and Ellison, 1999). There is a wide array of literature studying whether insider ownership affects firms' performance and the current consensus is that a positive correlation exists (e.g. McConnell et al., 1990). Recently Servaes et al. (2006) studied the relationship between fund performance and managerial ownership and they concluded that every basis point of managerial ownership improves the performance on average with 3-5 basis points. Another finding of them was that managers who manage more than one fund usually have higher ownerships.

There are also many other papers related to incentives for fund managers. Modigliani and Pogue (1975), Starks (1987), Grinblatt and Titman (1989), and Admati and Pfleiderer (1997) all support the explicit performance contracts between fund management company (or manager) and fund investor. Nevertheless, this kind of contracts between investors and fund companies haven't become widely used. As Berkowitz and Kotowitz (1993) note, contracts between fund companies and managers are much more common. In these contracts fund company usually pay a fixed fraction of assets under management for fund manager as a bonus. Thus these kinds of contracts implicitly contain a performance compensation element, because new money flows into a fund when the fund is performing well and out of the fund when the fund is doing poorly. Moreover, this drives manager to achieve same ultimate goal with the fund company: To maximize the assets under management.

To the author's best knowledge, studies about the effect of salary itself to the performance of fund manager, hasn't been made. Still, there seems to be at least one study about workers and rate of salary (Paarsch and Shearer, 1995). They found that employees work harder on average in jobs they got paid a good base salary. Still, it is unclear whether the better effort depends on higher salary or purely the fact that higher salary attracts better employees. Malkiel (1995), who believe in efficient markets and well performing managers to be purely lucky, shortly mentions in his study that well performing lucky managers tend to enjoy higher salaries than others in future. However, he doesn't seem to reveal any deeper empirical evidence for this.

2.2. Male vs. Female investors and fund managers

In the psychology and economics literature, there are number of studies about differences between male and female investors. Estes and Hosseini (1988), and Barber and Odean (2001) both studied differences between male and female investment strategies and financial decision making. Their findings suggest that females are less confident about their investment decisions. Moreover many studies (e.g., Powell and Ansic, 1997; Sunden and Suretta, 1998; Hinz, McCarthy and Turner, 1997) suggests that woman are more risk averse than men. More recently, Atkinson et al. (2003) studied differences between male and female investment behaviour, but they limited their study to professional money managers. This allowed them to study wealth and knowledge differences more carefully. Their major finding is that male and female managers appear similar in terms of fund performance, risk and other fund characteristics. However, they find that gender of manager affects the behaviour of mutual fund investors. Specifically they found significantly lower net asset flows into mutual funds managed by women compared with funds managed by men. This finding shed light on why there are relatively few female fund managers, given they appear to perform as well as males. Specifically, Atkinson et al. (2003) suggest that fund suppliers may be unwilling to hire a female manager, because there is a fear that investors prefer male-managed funds. Similar results have been found by Kim (1997), who suggests that it is more difficult for women to obtain money management jobs. These findings are in line with Powell and Ansic (1997), who argue that different investment strategies lead to stereotypical beliefs that females are less able financial decision makers. In addition, Heilman et al. (1989) contend that women are stereotyped as being less competent managers than men in any business. Also Oakley (2001) has similar results. Especially he stressed that gender stereotypes are the major reason for the lack of female CEOs, because people associate femininity with incompetence.

There is some discussion that investment behaviour differs between male and female fund managers. Barber and Odean (2001) argue that female managers should outperform males on risk-adjusted basis. This is because females trade less, and in theory, higher trading costs caused by active trading leads to on average lower net returns. Still, there is no support for this in practice. Moreover Atkinson et al. (2003) found no evidence about outperformance of either gender. However, they found that females are more reluctant to dramatically change the strategy or investment policy of the portfolio under their management. Among investors, even

differences between risk tolerances have been found. Jianakoplas and Bernasek (1998) compared self-reported risk tolerance between male and female investors. Women perceive themselves to be less inclined to take risk. This is consistent with Bajtelsmit and VanDerhei (1997), who found males' contribution plans more likely to hold risky assets, and Sunden and Suretta (1998), who find that women allocate retirement plans assets to more conservative investment choices. If risk aversion is truly gender specific, we should expect female managed funds to be managed more risk aversely. However, Schubert et al. (1999) argue that risk tolerance in not attributable to gender, suggesting that there should be no difference between male and female fund managers.

Besides gender, researchers have tried to identify some other characteristics that could help to identify a good portfolio manager. Golec (1996) argue that managers that are relatively young but still have managed the same fund long enough (at least 6 years) are the most successful. On the other hand, some researchers (e.g. Barry and Starks, 1984) believe that managers with greater human capital, measured by level of education, success better on average. Atkinson et al. (2003), who studied differences between male and female managers, also agrees that level of education have slightly positive effect on managers performance, but found no significant difference between education levels of male and female managers in U.S. However, in this thesis I concentrate only to one character of managers, their gender.

3. Hypothesis

In this section I introduce the hypothesis used in this study. Hypothesis are partly derived from earlier studies and partly derived from theory.

To my best knowledge, there are no earlier studies about correlation between fund manager's salary and performance of the fund. Thus thinking about this question, I have to rely on theory of highly efficient markets. According this theory, it is impossible to outperform markets systematically, because asset prices reflect the all relevant information. Under these assumptions, investors who beat the market are either lucky or they carry higher risks. Measuring the performance on risk-adjusted bases, this also means that fund managers should perform on average equally, despite of their salary. We end up to following hypothesis.

H1: The performance of fund can not be predicted by the last years' salary of the fund manager

Considering the effects of managerial ownership in mutual funds, there are some empirical results outside the Finnish markets. For example Servaes et al. (2006) found that higher managerial ownership is associated with somewhat higher performance. I also expect rational investors to use this information and hence expect net cash flows to be higher for funds with higher managerial ownership.

H2: Mutual funds with high fund managerial ownership perform on average better

H3: Mutual funds with higher managerial ownership experience on average higher net inflows of cash

There has been debated whether the gender of fund manager affects the performance of mutual fund. There are studies that argue females to be more risk averse in their investment decisions (e.g. Powell and Ansic, 1997), as well as studies that argue females to be better performers as investors (Barber and Odean, 2001). Still, most studies state that there is no difference on risk adjusted bases between male and female portfolio managers (e.g. Atkinson et al., 2003). In this study, I expected this statement to hold also in Finnish markets. In addition there is no reliable theory that would expect one gender to outperform the other.

H4: There is no difference between the performance of male and female fund managers

There is strong evidence that investors stereotype females to be less competent financial decision makers. Because of this disdaining behaviour of investors, net inflows of cash seem to be lower in funds that are managed by females in U.S. mutual fund markets (e.g. Kim, 1997; Atkinson et al, 2003). I expect this disdaining behaviour to exist also in Finnish mutual fund markets.

H5: The net inflows of cash to female managed funds are lower than net inflows to male managed funds

4. Data and descriptive statistics

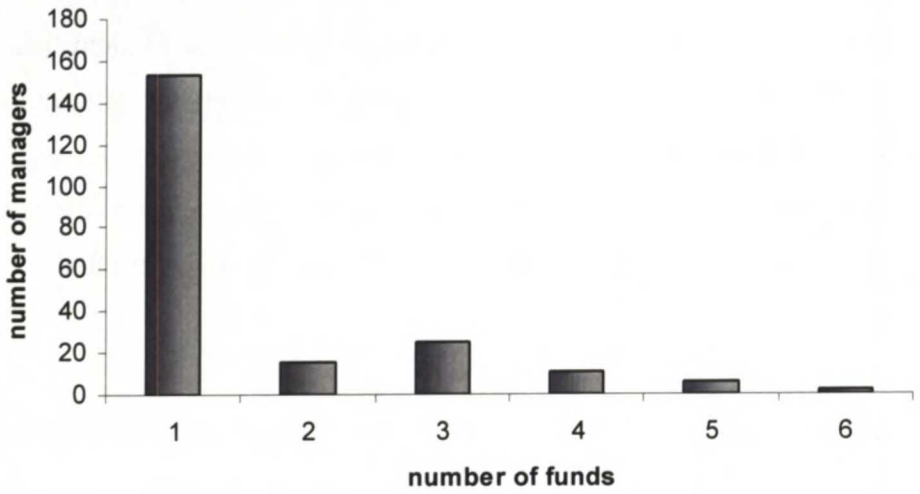
The basic data of mutual funds is gathered from mutual fund monthly reports which are made by Sijoitustutkimus Oy. The data consists of 344 mutual funds covering the 5 years period from January 2003 to December 2007. All these funds are registered in Finland. I left other funds outside the sample, because I was only able to get the ownership data and income information about the managers that operate in Finland. Longer time horizon, for example 10 years, would have been preferable, but unfortunately that would have decreased the number of funds too heavily. Moreover income and ownership data is not reliably available for such a period.

The reference mutual funds are distributed by large Scandinavian banks or individual asset management companies that offer their funds for Finnish investors. Somewhat more than half of these funds are distributed by banks, even thought market share of banks in Finnish mutual fund markets is much higher. These banks are Nordea (Merita before merger with Nordbanken), Osuuspankki, Handelsbanken, Danske Bank, Sampo Bank, Aktia Bank, Ålandsbanken, Pohjola and Tapiola. Names of distributors in sample and number of Finnish registered funds of all distributors are listed in appendix 1.

The oldest funds in the sample are Aktia Global and Aktia Secure, which have operated since December of 1993. This demonstrates that it took many years before fund management companies started to register any mutual funds in Finland, even thought the first funds became available for Finnish investors in 1987. As investing to mutual funds has become more popular among Finnish individuals, amount of offered mutual funds has substantially increase. However, number of funds registered in Finland have not grown rapidly before 21st century, even thought number of funds available for Finnish investors have been growing heavily since mid 1990's.

The amount of fund managers of the mentioned 344 funds varied between 207 and 225. The amount of managers is considerably smaller than number of funds, because many managers are managing more than one portfolio. At the end of year 2007, number of funds for each manager divided as shown in Figure 5.

Figure 5. Number of managers with each number of funds under management
This figure represents, how Finnish mutual fund managers divide by number or funds they have under their management at the end of year 2007. All managers have from 1 up to 6 funds. The data consists of funds that are registered in Finland. The data is gathered from the monthly fund reports of Sijoitustutkimus Oy.



As the Figure 5 demonstrates, most managers have only one fund under management. However it is also quite popular to have three funds. At the end of year 2007, there were 25 managers that had three funds. The amount is relatively high, because number of managers with two funds was only 15. Some managers had up to 6 funds.

The data that I use to estimate relationship between fund manager's salary and fund performance later in equation 2, is smaller than original data. The number of funds is 311 and the period under review is only three years. This is because income information was available only for years 2004 to 2006. Moreover there were few managers, who I was not able to specify from other Finnish people with same name, even thought I knew both first and middle name for each manager. I also left funds with multiple managers outside the sample, because in those cases it is impossible to specify manager's salary reasonably. Income data is gathered from *Veropörssi* magazines, published by Satamedia. I collected both earned income and capital income for each manager.

It is widely known that index funds on average can outperform actively managed funds and their management expenses are lower. Moreover managing index fund is much simpler, which mean that managing this type of fund should lead lower salary. However, index fund managers in my sample have usually many funds to manage and relatively good salary. This states that

managing index fund is in most often only the secondary task for the manager. To avoid skewed results caused by these strange relationships, I tested the income regression represented in Equation 2 both with and without index funds. In the test without index funds, sample size declined further by 10 funds. Finally I was reluctant to add index fund dummy variable to the regression as I originally planned, because of very small number of index funds.

Thinking about the income of fund managers, variance is extremely high. At year 2006, earned income of highest paid manager reached 643 000 euros. On the other hand, lowest earned income in the same year was only about 38 000 euros. The variance is even higher in capital income. Highest capital income in sample amounted to 506 000 euros (year 2004) whereas more than half of the managers didn't have capital income at all. Basic statistics about salaries of fund managers are shown in Table 2.

Table 2. Basic income data for fund managers

This table represents both earned income and capital income data for fund managers from years 2004, 2005 and 2006. For both income classes table shows following figures for each year: average, F90, F75, median, F25, F10, maximum and minimum. F90, F75, F25 and F10 values represents the percentage share of fund managers that earn less than this (e.g. F90 value means that 90% of managers earn less than shown value). The data consists of funds that are registered in Finland. Fund managers and mutual funds are gathered from reports of Sijoitustutkimus Oy. Income data for managers is gathered from Veropörssi magazines published by Satamedia Oy.

	year	average	F90	F75	median	F25	F10	max	min
	2004	94 600	143 800	109 000	78 300	63 100	47 500	326 100	33 800
Earned income	2005	96 100	147 700	101 300	78 800	68 000	52 400	533 700	41 000
	2006	100 800	149 600	107 400	82 200	66 900	52 700	643 300	38 100
	2004	18 300	27 500	11 000	0	0	0	506 100	0
Capital income	2005	15 400	25 000	8 200	0	0	0	498 900	0
	2006	15 600	26 300	6 000	0	0	0	505 300	0

Looking at Table 2, it seems that fund managers earn pretty well. Average earned income in sample period varies between 94 600 and 100 800 euros. Moreover it seems to be rising quite steadily, most likely because of high bonuses caused by bullish markets and relatively high portfolio returns. However, median was considerably lower, meaning that managers with highest salaries have strong effect to average. If you look at the value F90, you can see that top 10% of managers earn at least 143 800 to 149 600 euros, depending on year under review. On the other hand, F10 value shows that the lowest 10% earn only around 50 000 euros or less.

Increase in salaries during the sample period is natural because of incentive salaries. Stock markets were booming during 2004 – 2006, meaning that many managers had excellent portfolio returns and high bonuses.

Looking the capital income statistics, there are few surprises. Firstly, even the median for capital income is 0. I would have expected that people who are professional portfolio managers also invest themselves, but this does not seem to be the case very often. Actually it seems that very few of them are active market participants. However, lack of capital income does not necessary mean that those managers do not invest to their own funds. Many of the funds pay no dividends at all, which means that all returns are used to buy more investments to the portfolio. In these cases ownership does not increase capital income if the fund manager does not decrease the ownership by drawing the money out. Secondly, F75 value shows that even some of the top 25% capital incomes are lower than average. Thirdly, top 10% earn at least 25 000 - 27 500 euros capital income per year, which is still only a small fraction of the maximum. Thus the few managers with highest capital income skew the statistics substantially. Fourthly, F25 value is decreasing rapidly, which is alerting because it shows that managers are most likely even less and less active investors themselves.

I also wanted to create some statistics about income differences between male and female fund managers. These results are shown in Table 3.

Table 3. Income comparison between male and female fund managers

This table represents both earned income and capital income data for fund managers from years 2004, 2005 and 2006. All digits are shown for males and females separately. For both income classes table shows average and median for males and females. It also reveals number of male and female managers for each year. The data consists of funds that are registered in Finland. Fund managers and mutual funds are gathered from reports of Sijoitustutkimus Oy. Income data for managers is gathered from Veropörssi magazines published by Satamedia Oy.

			Earned income		capital income	
	Year	N	average	median	average	median
Male	2004	179	96 200	78 200	19 600	0
	2005	180	98 400	78 700	16 800	0
	2006	175	103 200	84 200	17 100	0
Female	2004	33	80 000	78 300	4 300	2 000
	2005	35	84 400	80 100	8 100	0
	2006	42	91 700	79 800	9 400	0

From Table 3 above, one can see that relatively few fund managers are females. Thus it is possible that some disdaining behaviour also exists also in Finnish markets. However it is also possible that amount of females is low because they may prefer to work in other fields of business. For example Korhonen (2001) studied value differences between young males and females and found some evidence that females value more soft factors while choosing their job. Especially social relations and virtues seemed to be more important for them than chance to success or earn high salaries. Thus maybe the field of finance is not the first choice for many females. In addition, percentage share of female fund managers in Finland is very high compared to U.S. fund markets. For example Atkinson et al. (2003) studied differences between male and female fund managers, and they found that only 5.6% of fund managers are females in U.S., compared to 15.6 - 19.4% in Finland during the sample period.

Considering the income differences between males and females, the situation is interesting. Both in 2004 and 2005 average of earned income is higher for males and median is higher for females. Only in year 2006 males achieve higher median salaries than females. Highest earned income for female fund manager under the sample period was 132 000 euros and highest capital income 27 000 euros, compared to highest earned income for male, 643 000 euros, and highest capital income for male, 506 000 euros. Lowest earned income for female was 44 000 euros and 33 800 euros for male. These results show that income gaps between female

managers are much smaller than income gaps between male managers. Like median demonstrates, mediocre paid female manager earns even a bit more than mediocre paid male manager during years 2004 and 2005. However, average income is higher for males because of the few extremely well paid managers, even thought average gap between males and females seems to be diminishing. Thus from this perspective there does not seem to be too much female disdaining in Finnish mutual fund markets.

During the sample period, earned income of fund managers has seemed to rise nicely. Despite of this, median for female managers has declined at year 2006. At the same year, median for males have grown considerably. Reason for this phenomenon could be found from the increased number of female fund managers in the same year. Many female managers in 2006 data are rookies, who naturally earn less than fund managers on average.

Contemplating the number of female managers, there is a clear growing trend. At the same time, number of funds under female managers has grown even faster. Number of both female managers and number of funds under their management has declined only in year 2007. The Figure 6 demonstrates this.

Figure 6. Number of female fund managers and number of funds under their management during 1998 – 2007

This figure represents the development of both number of female fund managers and also number of funds under their management. Results are shown from 10 years period, from 1998 to 2007. The data represents mutual funds that are registered in Finland. The data is gathered from the monthly fund reports of Sijoitustutkimus Oy.

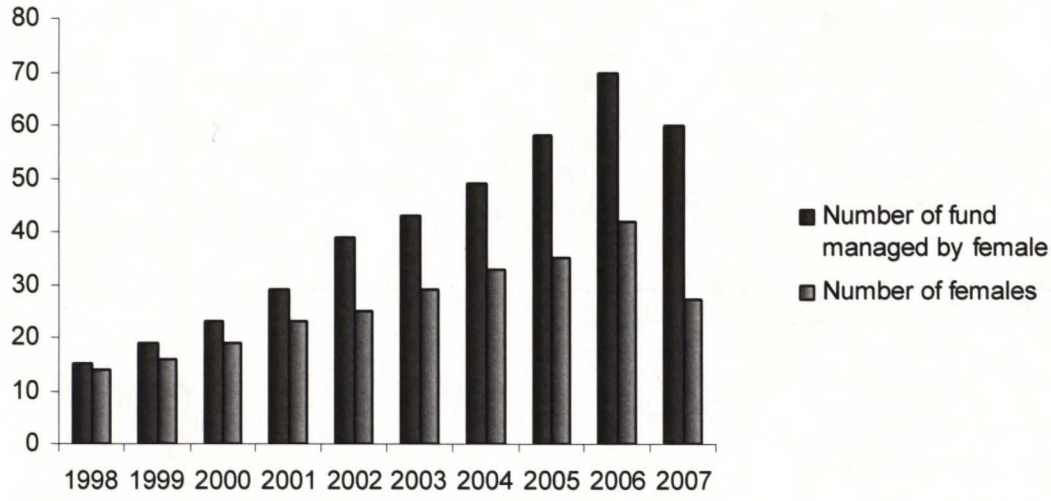


Figure 6 does not only demonstrate that both female fund managers and funds under their management have increased, but also that the gap between managers and number of funds has been considerably increasing. This is the case even in year 2007, when the number female managers have declined for the reason unknown. This means that more and more females are managing more than one portfolio. At year 2007 there is even more than 2 funds per female on average, which is extremely high ratio. Average for male managers in the same year is approximately 1.5 funds per manager. At the first glimpse, reason for this is hard to find. One possible explanation could be the unwillingness of management companies to hire female managers, because of the possible disdaining behaviour of investors as Atkinson et al. (2003) concluded. Thus fund companies may want to use already hired female managers accepted by investors in multiple funds instead of hiring new females. However, it is still unknown whether this disdaining behaviour exists in Finnish markets. Perhaps the regression analysis reveals some reasons for this phenomenon.

While the share of female fund managers in mutual fund business has increased, they have remained pretty focused to certain kind of fund types. Table 4 shows how females are divided between different fund categories during the period of 2003 to 2007. Both highest and lowest

amount of females are shown in numbers and also in percentages of all managers in certain fund type.

Table 4. Female managers in different fund categories

This table represents both number and percentage shares data of female managed funds for each fund type. For each fund category, both highest and lowest numbers of female managed funds, as well as highest and lowest percentage share of female managed funds are shown from the period 2003 to 2007. Digit Total funds show the number of funds for each category in this sample. Funds are categorised similarly as Sijoitustutkimus Oy categorise them in their monthly mutual fund reports. International stock funds in this classification stands for stock funds that invest at least part of the assets outside Europe. Special funds invest only in certain field of industry, for example in IT. The data consists of funds that are registered in Finland. Fund managers, mutual funds and inflow data are gathered from reports of Sijoitustutkimus Oy.

Category	Total funds	Female managed	%
Stocks Finland	36	1 - 7	3% - 19%
Stocks Europe	43	3 - 8	7% - 19%
Stocks International	47	12 - 15	26% - 38%
Emerging Market Stocks	22	2 - 4	9% - 18%
Short-term Bond	23	7 - 12	30% - 52%
Long-term Bond	27	2 - 5	7% - 19%
Multisector Bond	38	3 - 8	8% - 21%
High-yield Bond	5	0 - 1	0 - 20%
Mixed Stocks and Bonds	60	3 - 9	5% - 15%
Special	43	4 - 6	9% - 14%
Total	344	43 - 70	13% - 20%

As can be seen from Table 4, female managers seem to concentrate especially to manage international stock funds and short-term bond funds. Actually, year 2007 even more than half of short-term bond fund were managed by females. Reasons, why females seem to concentrate on managing these fund types, are unknown. Perhaps the argument that female managers carry less risk than their male counterparts (e.g. Jianakoplas and Bernasek, 1998) could be partly explained by the female concentration to short-term bond funds, which contain very low risks. However, this in not in line with the female concentration to manage international stock funds, which are usually far from low risks. Moreover, there are no empirical results that state females to carry less risk than males in Finnish fund markets, because earlier results are from United States. Considering other fund types, share of female managed funds seemed to remain in quite similar range for each of them. Surprisingly low shares of female managed funds can still be found. For example, at year 2003, only 3% of stock funds investing in Finland were

managed by female. Nevertheless, percentage of female managers in this category has increased later.

At this point I also wanted to present some statistics of the returns of fund managers. It seems that both average and median returns of all Finnish fund managers have been rising quite nicely during the sample period, as following Figure 7 reveals. Only exception seems to be year 2007, when both average and median of returns were considerably lower. However, this is natural, because 2007 was not as good for many markets as the previous years were. For example development of OMX Helsinki Index was much weaker than during few earlier years.

Figure 7. Return development of sample funds during 2003 – 2007
This figure represents, how both average and median of returns have developed among Finnish registered mutual funds. Both average and median is measured for each year, from 2003 to 2007. The data includes stock funds, bond funds and funds that invest in both of these. The data is gathered from the monthly fund reports of Sijoitustutkimus Oy.

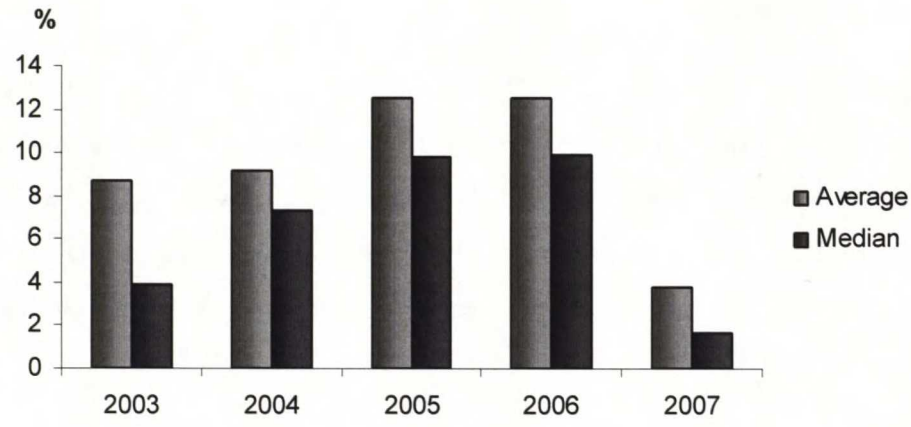


Figure 7 above includes mutual funds with all asset categories. This is the reason why one must understand not to compare these figures directly to any fund. It is natural that for example most stock funds have achieved higher returns than figures above because of their higher volatility. To compare performance of different fund types we use Sharpe's ratio. Those results are shown in the results section of this study.

As mentioned at the beginning, the Finnish mutual fund law was renewed in May 2005. According to the renewed version of the law, the ownership of mutual funds is public if the

person works at or for the company and has the possibility to affect the investment decisions of the mutual fund's assets. Furthermore, the investment fund company has an obligation to maintain a register, which contains all insiders' trades and possessions in the funds. All information must be entered to the register in such a way, that it can not be altered once entered. In addition, all interested persons have the right to see the register information and receive prints and copies from the register.

However, according to the old version of the law, those portfolio managers, who were not working at the company, in other words the portfolio management was outsourced, did not belong to insiders and their ownership information was not public. This posed some difficulties to the information gathering, since each portfolio manager belonging to this group should have to be personally asked whether his or her ownership information could be used for research purposes. Another problem that rose at the same time was reliability of information. All the asked managers would hardly remember value of their ownership precisely for each year. Because of these problems, I decided to leave out these outsourced managers. Fortunately this did not decrease the sample too much.

The ownership statistics are gathered personally from all mutual fund companies, who in turn obtain the information from their insider registers. Both the managers' personal ownership as well as the ownership of their firms is gathered. For purposes of this study, the two different ownership stakes are equal and are thus added to calculate the manager's total ownership. Finally, in case the fund has multiple managers, I add the ownership stakes of each manager to get the aggregate ownership of all managers running the fund.

The value of ownership is calculated by multiplying the manager's shares in the fund at the end of each year by the fund's net asset value of the same day. However, since I also want to conduct this analysis by using the percentage ownerships, the euro ownership are further divided by the size of the fund.

The original sample consists of 344 mutual funds. However, I needed to exclude funds with outsourced manager, which decreases the sample size by some quantity. The sample for which managerial ownership information since the beginning of year 2003 is available consists of 276 mutual funds, which is approximately 80% of the original sample.

Table 5 contains descriptive statistics of managerial ownership at the beginning of sample period. Ownership digits are shown both in euros and in percentages. Results are presented for all funds, as well as separately for equity funds and funds investing to other than equity assets.

Table 5. Descriptive statistics of managerial ownership

This table documents the euro amount and percentage ownership the fund managers have in the funds under their management at the beginning of year 2003. All funds are classified as either equity funds or other funds. This sample represents mutual funds registered in Finland. Number of funds in fund category, percentage of managers that have investments in their own fund, average, median, F75, F90 and max digits are all reported. F75 and F90 values represents the percentage share of fund managers that have less investments in their own fund than this (e.g. F90 value means that 90% of managers have less investments in fund under their management than shown value). Managerial ownership in these stats consists of the manager's personal ownership and possible ownership of his or her firm. Fund managers, their ownership stakes and mutual funds are gathered from reports of Sijoitustutkimus Oy.

Managerial ownership (€)

	N	%own	average	median	F75	F90	Max
All	276	38	22 875	0	2 315	4 656	1 108 509
Equity	155	31	36 461	0	1 234	7 177	1 108 509
Other	121	47	5 213	0	2 259	4 014	70 140

Managerial ownership (%)

	N	%own	average	median	F75	F90	Max
All	276	38	0,26	0	0,01	0,06	10,6
Equity	155	31	0,38	0	0,01	0,06	10,6
Other	121	47	0,09	0	0	0,01	1,3

Several results stand out. Firstly, only 38% of all managers owned any stakes in the funds they manage in the beginning of sample period. In other words, the median manager does not have any ownership in his fund. Secondly, the average ownership stakes seem to be pretty impressive; the average manager holds 22 875 euros worth of shares in his fund, which in turn translates into 0.26% of the size of the fund. However, averages are again largely affected by few outliers. We can see this by noting that only 10% of all managers own more than 4 656 euros worth of their fund's assets, which in turn represents only 0.06% of the total value of the fund. Thirdly, while the average ownership seems to be substantially higher in equity funds than in other funds, the relative amount of managers owning any shares in his or her fund is higher in other funds. Although few outliers affect again the average ownership, the same result holds if we investigate the F90 values that reflect top 10% highest ownerships.

Furthermore, there exists the possibility that some managers are mandated by the company to invest part of their personal wealth to the funds they manage. For this study there is no exact data about such requirements, but the available information suggests that some ownership mandates do exist at least in some companies. Whether the portfolio manager voluntarily invests in the fund or is required by the company to do so does not make any difference from an outside investor's point of view as long as such investment induces better performance. However, this could prove fund managers on average and without any ownership mandates to be even lazier investors to their own funds under management.

Investigating ownership data further, female managers seem to be lazier investors to funds under their own management than their male counterparts. Table 6 below proves these results.

Table 6. Managerial ownership comparison between males and females

This table documents the euro amount and percentage ownership the fund managers have in the funds under their management at the beginning of year 2003. Fund managers are divided to males and females. This sample represents mutual funds registered in Finland. Percentage of managers that have investments in their own fund, average, median, F75, F90 and max digits are all reported. F75 and F90 values represents the percentage share of fund managers that have less investments in their own fund than this (e.g. F90 value means that 90% of managers have less investments in fund under their management than shown value). Managerial ownership in these stats consists of the manager's personal ownership and possible ownership of his or her firm. Fund managers, their ownership stakes and mutual funds are gathered from reports of Sijoitustutkimus Oy.

Managerial ownership (€)

	%own	average	median	F75	F90	Max
All	38	22 875	0	2 315	4 656	1 108 509
Male	39	24 869	0	2 321	5 015	1 108 509
Female	34	14 902	0	2 287	3 223	324 033

Managerial ownership (%)

	%own	average	median	F75	F90	Max
All	38	0.26	0	0.01	0.06	10.6
Male	39	0.38	0	0.01	0.07	10.6
Female	34	0.09	0	0.01	0.04	3.0

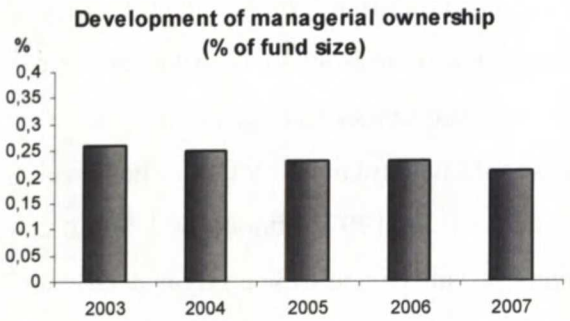
As one can see from the Table 6, females have fewer investments in funds under their personal management than males in any level. However, interesting point to realize is that ownership

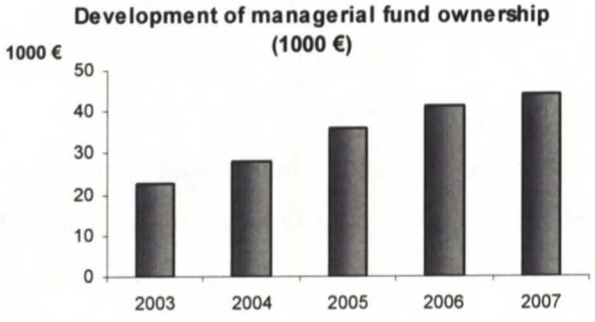
differences between male and female managers are very low in F75 level and the difference increases the more we go to the managers with highest ownership stakes. Finally, if we take a look at the maximum, the difference is enormous. Highest ownership stake of male manager is around 1.1 million euros, whereas highest ownership stake of female manager is only around 300 000 euros. Actually, the few male managers with enormous ownership stakes are also the main reason, why the average of male managers' ownership is so much higher than average for female managers. Still, percentage of managers that have ownership in fund under their own management, shown in first column in Table 6, reveals that female managers are lazier to invest in the fund under their management. This finding could be explained by the higher level of risk aversion among female investors (e.g. Powell and Ansic, 1997; Sunden and Suretta, 1998; Hinz et al., 1997). Thus also female fund managers possibly want to keep their personal wealth safe and not to invest it into the mutual funds, especially those that include high risk. Usually this phenomenon could be explained by the lower salaries that females earn in general. However, this is not valid explanation in this case, because as seen earlier in this study, median salary of female fund managers is relatively close to the level of male managers.

During the sample period, there were not too many changes in amount of fund managers that invest their own fund. In addition, ownership differences between male and female managers seemed to remain relatively constant. However, ownerships in terms of euros are quite constantly growing. This is natural because markets were bullish during the whole sample period, thus value of managerial investments must have been growing at the same time even thought there would have been only minor additional investments during the period. Managerial ownership in percentage terms on the other hand, has been slowly declining. Reason for this is expectably the constantly increasing amount of capital invested to mutual funds by the public. The following Figure 8 demonstrates these findings.

Figure 8. Development of managerial ownership

This figure documents the development of managerial ownership in Finnish registered mutual funds. Both euro amount and percentage ownership the fund managers have in the funds under their management are reported from period 2003 - 2007. Managerial ownership in these stats consists of the manager's personal ownership and possible ownership of his or her firm. Fund managers, their ownership stakes and mutual funds are gathered from reports of Sijoitustutkimus Oy.





5. Methodology

This chapter describes the methodology employed in this study. Stated hypotheses are tested using nine separate regression models. I was forced to create so many individual regression models, because I have different amounts of data considering salary, ownership and gender variables. Thus huge amount of important information would have been lost if I would have put all these variables in the same models. For example, I have income data only from three years compared to five years gender data.

To measure performance, I have used Sharpe's ratio, which calculates the fund's excess return relative to the risk of the fund. These Sharpe's ratios are found from mutual fund annual reports, but the general way to calculate Sharpe's measure is shown in equation 1.

(1) $$Sharpe = \frac{r - r_f}{\sigma}$$

r = fund return

r_f = average risk-free rate

σ = volatility

Sharpe's ratio is used to estimate fund performance, because it is assumed that an average investor is interested in the best risk-return relationship, for which the Sharpe's ratio is a proper estimate.

Manager's salary and performance of the fund

Firstly, I calculated a multivariate regression of performance as a function of lagged managerial salary and the following control variables: fund's size, net cash inflows, overall expenses, fund type and observation year. These control variables are commonly used in fund performance literature (e.g. Lesseig et al., 2001). Overall expenses is an essential variable, because every investor should be concerned about high expenses, especially if the fund manager is not able to achieve superior returns. Moreover expensive funds should perform worse on average, because similar gross returns associated with higher fees lead to lower net return for investor (e.g. Korkeamäki and Smythe, 2004). Well argued reason to use expenses as variable is also the fact that considering manager's skills or future trends, it is the only easily predictable variable affecting the future performance (Dellva and Olson 1998). In this study, overall expenses include management fees and 20% of initial and exit fees. Taking into account only 20% of these load fees, I have expected average investment period to be 5 years. I was forced to act like this, because adding the full amount of load fees would skew the results, and I found five years period quite reasonable for normal fund investor. On the other hand, load fees are included to overall fees to keep the model simple. This way, I do not need three separate variables to measure different fee types.

Considering fund size and net cash inflows, they are important, because they can show us whether funds associated with high manager's salary are popular or not among investors, and whether managers of big funds earn more. Size of the fund is important also because it may affect the performance. Atkinson et al (2003) argues that larger funds can benefit somewhat from the economies of scale, but on the other hand, small funds can more easily purchase or sell securities without altering securities prices. It is unclear which one of the benefits is more significant. Thinking about cash inflows, they are eventually the most important thing for a profit maximizing fund company and hence they even use this to measure performance of their managers (Khorana, 1996).

Dummy variables that separate stock funds, bond funds and funds that invest in both of these assets are in regression only to improve the quality of other results. Namely the fund type can considerably affect to average Sharpe ratios, and thus leaving these dummy variables out could lead to wrong conclusions. However, it is not obvious whether stock and bond funds are directly comparable or not. In theory, Sharpe ratio should be relatively fair indicator for funds that even represent different categories, because it takes risk into account while valuating the rate of return. Finally I end up using the following regression models (Equations 2, 3 and 4) both with and without stock and bond fund dummies. Dummy variables that reflect the observation years are in model more or less because of same reason. Different market conditions and thus different observation years have strong influence to the Sharpe ratios.

The regression model I used to test mentioned correlations is shown below in equation 2:

(2) $$R_{it} = b_0 + b_1 x_{1i,t-1} + b_2 x_{2i,t-1} + b_3 x_{3it} + b_4 x_{4it} + b_5 x_{5it} + b_6 D_{1i} + b_7 D_{2i} + b_8 D_{3i} + b_9 D_{4i}$$

Where the variables are the following:

R_{it} = annual risk adjusted return for investor of fund i at year t

$x_{1i,t-1}$ = fund manager's earned income of fund i at year t-1

$x_{2i,t-1}$ = fund manager's capital income of fund i at year t-1

x_{3it} = size of fund i at year t

x_{4it} = net cash inflows of fund i at year t

x_{5it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{1i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{2i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{3i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{4i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

For the purposes of regression above and also for latter regressions I named observation years 2003 – 2007 as 1 – 5. Thus in regression above base year is 3 (2005), because income data, that I used lagged, is available from year 2 (2004) onwards.

Managerial ownership and performance on the fund

Secondly, I calculated a multivariate regression of performance as a function of lagged managerial ownership and same control variables as I used in equation 2 above. Here the amount of expenses is especially vital, because it helps as to see whether fund managers avoid their own fund when the fees are high. This could be the case even thought the performance would have been good earlier, because as mentioned before, fees are often the only easily predictable factor in mutual fund.

The regression model I used to test mentioned correlations is shown below in equation 3:

(3) $$R_{it} = b_0 + b_1 x_{1i,t-1} + b_2 x_{2it} + b_3 x_{3it} + b_4 x_{4it} + b_5 D_{1i} + b_6 D_{2i} + b_7 D_{3i} + b_8 D_{4i} + b_9 D_{5i}$$

Where the variables are the following:

R_{it} = annual risk adjusted return for investor of fund i at year t

$x_{1i,t-1}$ = fund manager's ownership of fund i at year t-1

x_{2it} = size of fund i at year t

x_{3it} = net cash inflows of fund i at year t

x_{4it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{1i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{2i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{3i} = dummy variable, 1 if observation is from year 3 and 0 if from other year

D_{4i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{5i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

For the purposes of regression above and also for latter regressions I named observation years 2003 – 2007 as 1 – 5. Thus in regression above base year is 2 (2004), because ownership data, that I used lagged, is available from year 1 (2003) onwards.

Manager's gender and performance

Thirdly, I calculated a multivariate regression of performance as a function of manager gender and again same control variables as I used in equation 2 and 3. This regression helps us to see whether there is difference between performance of male and female managers and whether investors disdain female managers.

The regression model I used to test mentioned correlations is shown below in equation 4:

(4) $$R_{it} = b_0 + b_1 D_{1it} + b_2 x_{2it} + b_3 x_{3it} + b_4 x_{4it} + b_5 D_{2i} + b_6 D_{3i} + b_7 D_{4i} + b_8 D_{5i} + b_9 D_{6i} + b_{10} D_{7i}$$

Where the variables are the following:

R_{it} = annual risk adjusted return for investor of fund i at year t

D_{1it} = dummy variable, 1 if fund manager is female and 0 if fund manager is male

x_{2it} = net inflows to fund i at year t

x_{3it} = size of fund i at year t

x_{4it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{2i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{3i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{4i} = dummy variable, 1 if observation is from year 2 and 0 if from other year

D_{5i} = dummy variable, 1 if observation is from year 3 and 0 if from other year

D_{6i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{7i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

For the purposes of regression above and also for latter regressions I named observation years 2003 – 2007 as 1 – 5. Thus in regression above base year is 1 (2003).

Net inflows regressions

To measure the relationship between net inflows and other variables, I constructed three more regression models. In these models, net inflows are dependent variables. Independent variables are the same as in performance regressions earlier, except that now the independent variable net inflow is replaced with Sharpe ratio. Moreover there is one more dummy variable. This dummy is purposed to separate the fund distributors to banks and non-banks. I wanted to add this dummy variable, because it is interesting to see whether banks or non-banks are having higher net inflows and thus either group is growing its market share. As one can see, bank versus non-bank distributors dummy has been left out of the performance regressions earlier. There are two reasons for this. Firstly, relationship between performance and distributor has already been studied in Finnish markets (e.g. Korkeamäki and Smythe, 2004), thus it is not in my interests in this study. Secondly, performance difference between banks and non-banks are mostly explained with higher fees that banks charge (Korpela and Puttonen, 2005). This means that independent variable, overall fees, already takes distributor differences very well into account. Moreover, leaving distributor dummy outside performance models kept the models more simple. Sharpe ratio (performance) is in these models as independent variable, because it is observed to be one explanator for net inflows (Sirri and Tufano, 1998). Equations 5, 6 and 7 reveal net inflow regression models.

The regression model I used to test relationship between net inflows and managerial income is shown in equation 5:

(5)

$$IF_{it} = b_0 + b_1 x_{1i,t-1} + b_2 x_{2i,t-1} + b_3 x_{3it} + b_4 x_{4i,t-1} + b_5 x_{5it} + b_6 D_{1i} + b_7 D_{2i} + b_8 D_{3i} + b_9 D_{4i} + b_{10} D_{5i}$$

Where the variables are the following:

IF_{it} = net cash inflows of fund i at year t

$x_{1i,t-1}$ = fund manager's earned income of fund i at year t-1

$x_{2i,t-1}$ = fund manager's capital income of fund i at year t-1

x_{3it} = Sharpe's ratio of fund i at year t

$x_{4i,t-1}$ = size of fund i at year t-1

x_{5it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{1i} = dummy variable, 1 if fund is bank managed and 0 if fund is non-bank managed

D_{2i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{3i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{4i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{5i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

The regression model I used to test relationship between net inflows and managerial ownership is shown in equation 6:

(6)

$$IF_{it} = b_0 + b_1 x_{1i,t-1} + b_2 x_{2it} + b_3 x_{3i,t-1} + b_4 x_{4it} + b_5 D_{1i} + b_6 D_{2i} + b_7 D_{3i} + b_8 D_{4i} + b_9 D_{5i} + b_{10} D_{6i}$$

Where the variables are the following:

IF_{it} = net cash inflows of fund i at year t

$x_{1i,t-1}$ = fund manager's ownership of fund i at year t-1

x_{2it} = Sharpe's ratio of fund i at year t

$x_{3i,t-1}$ = size of fund i at year t-1

x_{4it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{1i} = dummy variable, 1 if fund is bank managed and 0 if fund is non-bank managed

D_{2i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{3i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{4i} = dummy variable, 1 if observation is from year 3 and 0 if from other year

D_{5i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{6i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

The regression model I used to test relationship between net inflows and gender is shown in equation 7:

(7)

$$IF_{it} = b_0 + b_1 D_{1it} + b_2 x_{2it} + b_3 x_{3i,t-1} + b_4 x_{4it} + b_5 D_{2i} + b_6 D_{3i} + b_7 D_{4i} + b_8 D_{5i} + b_9 D_{6i} + b_{10} D_{7i} + b_{11} D_{8i}$$

Where the variables are the following:

IF_{it} = net cash inflows of fund i at year t

D_{1it} = dummy variable, 1 if fund manager is female and 0 if fund manager is male

x_{2it} = Sharpe's ratio of fund i at year t

$x_{3i,t-1}$ = size of fund i at year t-1

x_{4it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{2i} = dummy variable, 1 if fund is bank managed and 0 if fund is non-bank managed

D_{3i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{4i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{5i} = dummy variable, 1 if observation is from year 2 and 0 if from other year

D_{6i} = dummy variable, 1 if observation is from year 3 and 0 if from other year

D_{7i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{8i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

Volatility regressions

Finally, I wanted to get some additional results out of this data by replacing performance with volatility in Equations 2, 3 and 4. This way I can see whether the personal ownership or salary level of manager affects the risk taking. Moreover possible risk taking differences between males and females can be figured out. At least some earlier studies have recognised male managers to take more risk in U.S. markets even thought males and females perform equally on risk adjusted basis (e.g. Powell and Ansic, 1997). In these volatility regression models, just like in net inflow models, I wanted to add the dummy variable that separates the distributors (bank vs. non-bank). Equations 8, 9 and 10 reveal volatility regression models.

The regression model I used to test relationship between volatility and managerial salary is shown in equation 8:

(8)

$$\sigma_{it} = b_0 + b_1 x_{1i,t-1} + b_2 x_{2i,t-1} + b_3 x_{3i,t-1} + b_4 x_{4it} + b_5 x_{5it} + b_7 D_{1i} + b_8 D_{2i} + b_9 D_{3i} + b_{10} D_{4i} + b_{11} D_{5i}$$

Where the variables are the following:

σ_{it} = annual volatility of fund i at year t

$x_{1i,t-1}$ = fund manager's earned income of fund i at year t-1

$x_{2i,t-1}$ = fund manager's capital income of fund i at year t-1

$x_{3i,t-1}$ = size of fund i at year t-1

x_{4it} = net cash inflows of fund i at year t

x_{5it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{1i} = dummy variable, 1 if fund is bank managed and 0 if fund is non-bank managed

D_{2i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{3i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{4i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{5i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

The regression model I used to test relationship between volatility and managerial ownership is shown in equation 9:

(9) $$\sigma_{it} = b_0 + b_1 x_{1i,t-1} + b_2 x_{2it} + b_3 x_{3i,t-1} + b_4 x_{4it} + b_6 D_{1i} + b_7 D_{2i} + b_8 D_{3i} + b_9 D_{4i} + b_{10} D_{5i} + b_{11} D_{6i}$$

Where the variables are the following:

σ_{it} = annual volatility of fund i at year t

$x_{1i,t-1}$ = fund manager's ownership of fund i at year t-1

x_{2it} = size of fund i at year t

$x_{3i,t-1}$ = net cash inflows of fund i at year t-1

x_{4it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{1i} = dummy variable, 1 if fund is bank managed and 0 if fund is non-bank managed

D_{2i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{3i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{4i} = dummy variable, 1 if observation is from year 3 and 0 if from other year

D_{5i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{6i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

The regression model I used to test relationship between volatility and gender is shown in equation 10:

(10)

$$\sigma_{it} = b_0 + b_1 D_{1it} + b_2 x_{2it} + b_3 x_{3i,t-1} + b_4 x_{4it} + b_6 D_{2i} + b_7 D_{3i} + b_8 D_{4i} + b_9 D_{5i} + b_{10} D_{6i} + b_{11} D_{7i} + b_{12} D_{8i}$$

Where the variables are the following:

σ_{it} = annual volatility of fund i at year t

D_{1it} = dummy variable, 1 if fund manager is female and 0 if fund manager is male

x_{2it} = net inflows to fund i at year t

$x_{3i,t-1}$ = size of fund i at year t-1

x_{4it} = overall management expenses (including also initial and exit fees) of fund i at year t

D_{2i} = dummy variable, 1 if fund is bank managed and 0 if fund is non-bank managed

D_{3i} = dummy variable, 1 if fund invests only in stocks and 0 if fund invests also in other assets

D_{4i} = dummy variable, 1 if fund invests only in bonds and 0 if fund invests also in other assets

D_{5i} = dummy variable, 1 if observation is from year 2 and 0 if from other year

D_{6i} = dummy variable, 1 if observation is from year 3 and 0 if from other year

D_{7i} = dummy variable, 1 if observation is from year 4 and 0 if from other year

D_{8i} = dummy variable, 1 if observation is from year 5 and 0 if from other year

6. Results

This chapter represents the results of used regression models and major findings. In addition, the chapter includes discussion about possible causals and consequences for these findings.

6.1. Contribution of salary

I tested the relationship between mutual fund performance and lagged fund manager's salary by using regression model shown in methodology chapter as Equation 2. Because it is unclear in practice, whether Sharpe ratios of stock and bond funds are directly comparable, I used Equation 2 with and without dummy variables that separate bond funds, stock funds, and funds that invest in both of these asset types. Table 7 summarizes the output of regression.

Table 7. OLS Regression results: contribution of manager's salary to Sharpe's ratio
This table documents the OLS regression results where fund performance (measured by Sharpe's ratio) is dependent variable. Earned income and capital income digits are measured as lagged from years 2004 to 2006. Control variables are measured from years 2005 to 2007. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy and from Veropörssi magazines of Satamedia Oy. This sample includes also the index funds.

N = 311	Model (i)	Model (ii)
Earned income	-0.001	-0.001
	(0.343)	(0.343)
Capital income	-0.001	-0.001
	(0.482)	(0.596)
Net inflows	0.343*	0.303*
	(0.053)	(0.085)
Size	-0.012	-0.012*
	(0.173)	(0.058)
Overall expenses	-0.230*	-0.308**
	(0.056)	(0.016)
Stock fund (dummy)	0.207	
	(0.211)	
Bond fund (dummy)	-0.160	
	(0.488)	
Year 4 (dummy)	0.432***	0.420***
	(0.003)	(0.001)
Year 5 (dummy)	-2.174***	-2.152***
	(0.000)	(0.000)
Adjusted R Square	0.210	0.208

Looking at the regression results above, it seems obvious that income of fund manager does not have any relationship with the performance of the fund in Finnish markets. In both models (i and ii) correlation of independent variables last years earned income and last years capital income is not significant in any level with dependent variable Sharpe ratio. This finding is supported by financial theory. According highly efficient markets, fund managers should not be able to continuously pick "winner" securities. Thus their salaries are higher in years they perform well because of performance bonuses and risings in base salary, but this does not mean they perform well persistently in following year. Nevertheless it sounds quite surprising in practice for several reasons. Firstly, salaries of fund managers seem to remain on higher level after good performance. This is natural on the following year because of the last year's performance bonuses, but not any more after this. This sounds irrational if they are not able to

achieve good results also in future after the rise in salary. Secondly, there are huge differences between the salaries of highly paid and lowly paid managers. As shown in Table 2 in chapter Data and descriptive statistics, highest 10% of managers earned about 150 000 euros or more whereas lowest 10% earned around 50 000 euros or less during years 2004 – 2006. This raises the question why some managers earn so much more than others if they are not persistently better. Moreover it is unclear how fund management companies choose the managers they want to pay high salaries. For further research it would be interesting to study managerial characteristics that are associated with high salary. Thirdly, according these results average investor should not give too much attention for the manager or their achievements while choosing the fund. More relevant factors to consider would be analogue between own risk preferences and risk level that fund carries, and amount of fees.

To find out, whether index funds skew the regression results, I tested Equation 2 also without index funds. Regression output without index funds is represented in the following table.

Table 8. OLS Regression results: contribution of manager's salary to Sharpe ratio (Excl. index funds)

This table documents the OLS regression results where fund performance (measured by Sharpe's ratio) is dependent variable. Earned income and capital income digits are measured as lagged from years 2004 to 2006. Control variables are measured from years 2005 to 2007. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy and from Veropörssi magazines of Satamedia Oy. Index funds have been excluded from the sample.

N = 301	**Model (i)**	**Model (ii)**
Earned income	-0.001	-0.001
	(0.345)	(0.345)
Capital income	-0.001	-0.001
	(0.540)	(0.699)
Net inflows	0.399	0.370
	(0.109)	(0.126)
Size	-0.001	-0.001**
	(0.120)	(0.033)
Overall expenses	-0.272	-0.367
	(0.109)	(0.113)
Stock fund (dummy)	0.174	
	(0.215)	
Bond fund (dummy)	-0.226	
	(0.348)	
Year 4 (dummy)	0.411***	0.434***
	(0.001)	(0.000)
Year 5 (dummy)	-2.177***	-2.161***
	(0.000)	(0.000)
Adjusted R Square	0.201	0.193

Looking at the Table 8 above, it is very easy to recognize that disturbing effect of index funds is very meaningless. Results are mostly similar with the sample including index funds. However, couple of minor changes exists in control variables, but we can further discuss about these differences later.

To further analyze regression results, it is desirable to contemplate correlations between independent variables. This reveals that in Model i, dummies that separate pure stock funds and pure bond funds have high negative correlation (-0.56). This may cause multicollinearity and distortion to results. Moreover adjusted R square is not significantly better in Model i than

in Model ii. Thus model ii seems more valid, even thought the both models give very similar results. Otherwise there does not seem to be especially high correlations between independent variables that could endanger the validity of the results.

In this point, I want to take a look at the correlations between managerial salaries and other variables in regression model. Results are shown in Table 9. Correlations to earned income and capital income are both represented.

Table 9. Income correlations

This table documents the correlations of both earned income and capital income with other independent variables and dependent variable Sharpe ratio. Earned income and capital income digits are measured as lagged from years 2004 to 2006. Control variables and Sharpe ratios are measured from years 2005 to 2007. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy and from Veropörssi magazines of Satamedia Oy.

	Correlation with Earned income	Correlation with Capital income
Sharpe ratio	-0.034	0.032
Earned income	1	0.093
Capital income	0.093	1
Net inflows	-0.100	-0.029
Size	-0.038	-0.062
Overall expenses	0.327	0.047
Stock fund (dummy)	0.198	0.084
Bond fund (dummy)	-0.130	-0.137

As the table above demonstrates, most obvious correlation seems to be between earned income and overall expenses. Moreover this correlation is positive meaning that higher managerial salaries are associated with higher fees for investors. Thus as I mentioned earlier, manager's salary could well be one explanator for fund fees. Still, more surprising is the negative correlation between earned income and net inflows, which is not very strong but still noticeable. This finding means that investors, at least in small extent, have realized to avoid highly paid managers, who cause pressure for fund companies to increase management fees, but do not give reason to expect better performance in following years. However, the portion of investors who reacts this way is most likely few professional investors with heavy bets, because income data of different fund managers is not quickly and effortlessly available, and most small investors maybe do not even come up with the idea that highly paid manager could

be worse in real life. In any case, it seems irrational for fund management companies to pay high salaries for some managers if this has negative effects to net inflows.

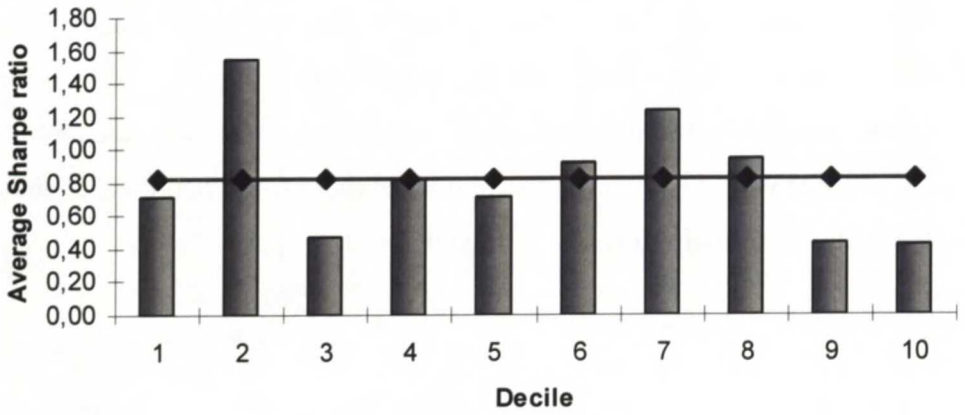
Another finding worth to mention is that according Table 9, stock fund managers earn on average somewhat more than bond fund managers, even thought bond funds are slightly bigger on average. Reason for this could be the higher risks that managers of stock funds need to carry. This also means that stock fund managers have higher probability to very good or very bad performance, which affects their salaries in two ways. Firstly, well performing managers have higher salaries because of bonuses and possible salary risings. Secondly, under average stock fund manager would be expected to require higher salary than their counterparts managing bond funds, because their funds have higher risk to experience very heavy losses and end up dismissed.

Considering capital income and its correlation with other variables, they all seem to be low. Actually, this is quite reasonable, because capital income reflects fund manager's personal investment activity which should have nothing to do with the fund under manager's control. Moreover as I already mentioned, high capital income doesn't mean that the manager have a lot of investments in the fund under his or her management. This is because many mutual funds don't pay dividends, meaning that high personal ownership in fund is not necessarily associated with high capital income. In fact also fund investors seem to ignore this information, because there is almost not at all correlation between net inflows and capital income of manager. Nevertheless, I expected it to be possible, that investors have more faith to managers, who have capital income and thus believe in investing themselves.

As the results point out, there does not seem to be relationship between performance and lagged salary of fund manager on average. Still, I wanted to take look, how the few highest paid managers perform. On the other hand it is interesting to know whether the managers with lowest salaries perform worse. Figure 9 below divides managers to deciles according their earned income rate and then shows the average Sharpe ratio inside each decile.

Figure 9. Average Sharpe ratios for earned income deciles

This figure represents the average Sharpe ratio for manager's of Finnish registered mutual funds. Managers are divided to deciles according their earned income (e.g. decile 1 consists of 10% of managers that have highest earned income, decile 10 consists of 10% of managers with lowest income). The dotted line reveals the average Sharpe ratio for the whole sample. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy and from Veropörssi magazines of Satamedia Oy.



As Figure 9 reveals, the few highest paid managers are far from "stars". Actually, the average Sharpe ratio for the decile consisting of managers with highest earned income is lower than Sharpe ratio for the whole sample. On the other hand, managers that are in the second highest earned income decile have clearly the highest Sharpe ratio. Thus real "star" managers are not the highest paid but still they earn substantially more than average managers. Otherwise it is very difficult to find any pattern for salary and performance. Only one thing shows up without a doubt: managers in two lowest earned income deciles have Sharpe ratios far under sample average. This means that at least among the worst managers, salary-performance relationship works.

To make sure, whether the correlation between net inflows and managerial income is significant, I used Equation 5. Regression results prove that also inflows, just like performance, does not have any significant relationship with managerial salary. Moreover the coefficient for earned income and capital income is very close to zero in mentioned model, which means that their contribution is not just insignificant but also very weak. Thus investors does not seem to give attention for managers salary while choosing the fund even thought Table 9 showed some weak negative correlation between earned income and net inflows.

At the end of this part, let's take another look at the hypothesis related to managerial salary:

H1: The performance of fund can't be predicted by the last years' salary of the fund manager

As the regression results and discussion in this section state, there does not seem to be any relationship between fund performance and lagged managerial salary in Finnish mutual fund markets. Hence the hypothesis 1 holds.

6.2. Contribution of ownership

I tested the relationship between mutual fund performance and fund manager's lagged personal ownership in fund under his or her management by using regression model shown in methodology chapter as Equation 3. This regression is very similar to the one that I used to test relationship between lagged manager's salary and fund performance. Only important difference is that independent variables, lagged earned income and lagged capital income, are now replaced with variable lagged managerial ownership. Another difference compared to salary regression is that there is now one more dummy separating years from each other. This is because there was ownership data available from longer period and sample period is now one year longer, from 2004 to 2007. Managerial ownership in these regressions is measured in Euros. I abandoned the idea to measure them in percentage of fund assets, because in this case fund size would become basically the only important explanatory factor. In addition I also believe fund managers to be more concerned about the euro amount of their investments than the percentage ownership they have in funds under their management.

Also in this case, I used the equation with and without stock fund and bond fund dummies, because their possible effects to Sharpe ratio remain unclear. Regression results are represented for all funds in the sample and only for those funds that have positive managerial ownership. I did these both regressions because number of managers with positive managerial ownership is relatively small. This means that in sample of all funds, differences between funds that have positive managerial ownership does not show up that easily. Thus the sample including all funds is good to measure whether managerial ownership affect the results. On the other hand, sample including only positive managerial ownership funds can better be used to

measure whether the size of positive managerial ownership affects the performance. Tables 10 and 11 summarize the outputs of regression.

Table 10. OLS Regression results: contribution of managerial ownership to Sharpe's ratio, all funds

This table documents the OLS regression results where fund performance (measured by Sharpe's ratio) is dependent variable. Managerial ownership digits are measured as lagged from years 2003 to 2006. Control variables are measured from years 2004 to 2007. This table includes all the funds in the sample. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

N = 276	Model (i)	Model (ii)
Manager's ownership	0.925*	1.025*
	(0.099)	(0.083)
Net inflows	0.757*	0.976**
	(0.068)	(0.025)
Size	0.914	1.114
	(0.184)	(0.105)
Overall expenses	-0.480	-2.200**
	(0.133)	(0.049)
Stock fund (dummy)	0.089	
	(0.621)	
Bond fund (dummy)	-0.120	
	(0.503)	
Year 3 (dummy)	0.788***	0.788***
	(0.000)	(0.001)
Year 4 (dummy)	0.337**	0.274**
	(0.012)	(0.014)
Year 5 (dummy)	-1.101***	-1.141***
	(0.000)	(0.000)
Adjusted R Square	0.144	0.192

Table 11. OLS Regression results: contribution of managerial ownership to Sharpe's ratio, funds with positive managerial ownership

This table documents the OLS regression results where fund performance (measured by Sharpe's ratio) is dependent variable. Managerial ownership digits are measured as lagged from years 2003 to 2006. Control variables are measured from years 2004 to 2007. This table includes only the funds that had positive managerial ownership in the sample. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

N = 104	Model (i)	Model (ii)
Manager's ownership	1.107*	2.925*
	(0.082)	(0.080)
Net inflows	0.758*	0.996*
	(0.068)	(0.081)
Size	1.222*	0.896
	(0.085)	(0.163)
Overall expenses	-1.149	-1.972*
	(0.143)	(0.054)
Stock fund (dummy)	0.365	
	(0.733)	
Bond fund (dummy)	-0.727	
	(0.491)	
Year 3 (dummy)	0.848***	0.789***
	(0.001)	(0.001)
Year 4 (dummy)	0.573**	0.423**
	(0.024)	(0.023)
Year 5 (dummy)	-1.811***	-2.055***
	(0.00)	(0.000)
Adjusted R Square	0.032	0.120

As tables above show, there seem to be quite weak, but still some evidence that funds with managerial ownership perform better on average. In both models managerial ownership is significant explanator for Sharpe ratio only in 10% significance level. The situation is same in both tables, meaning that both existence of managerial ownership and its size affect the performance. This evidence is somewhat weaker than evidence from U.S markets. However, some evidence still exists. There are many possible explanations for this phenomenon. Firstly, managers that have personal investments in fund under their management, have higher incentives to perform better. Thus they may analyze possible investment opportunities more detailed and take more deliberate allocation choices or better argued risks. This theory would be supported by the fact that companies want to pay high bonuses for good performance. Still,

it is weird that relatively few companies require their fund managers to have investments in the fund they manage. Secondly, as insiders, fund managers have more information about the possible outcomes of taken bets and strategies used in investment decisions. This leads to the fact, that managers want to invest their own money to the fund only when chances to success are good and risks compared to expected returns are on reasonable level. Thirdly, we should be able to exclude at least the worst performing managers from the group of managers that have investments in fund under their management. This is reasonable expectation, because very badly performing managers usually want to keep all the risks in modest level to avoid dismissal (Brown et al., 2001). Thus manager that knows the risk of dismissal to be real, surely wants to play safe with his or her personal wealth and not to keep it in fund that is struggling for survival and has inefficient asset allocation.

The explanatory power of model does not increase in this case when more explanatory variables are added. Actually, adjusted R square seems to substantially lower, when stock fund and bond fund dummies are added. Situation is similar for samples of all funds and for funds with positive managerial ownership.

It is also desirable to take a look at the correlations between managerial ownership and other variables. This way we may get some perspective, how markets react to managers that have investments in their own funds. These correlations are represented in Table 12.

Table 12. Correlations with managerial ownership

This table documents the correlation of managerial ownership with other independent variables and dependent variable Sharpe ratio. Results are revealed individually for sample consisting all funds and the sample of funds with positive managerial ownership. Managerial ownership digits are measured as lagged from years 2003 to 2006. Control variables and Sharpe ratios are measured from years 2004 to 2007. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

	Sample of all funds	Sample of positive managerial ownership
Sharpe ratio	0.283	0.228
Net inflows	0.170	0.143
Size	0.034	-0.126
Overall expenses	-0.026	0.010
Stock fund (dummy)	0.309	0.286
Bond fund (dummy)	-0.108	-0.147

Looking at the correlations between managerial ownership and other variables, they seem to be very similar in both samples, the one with all funds and the one with funds of positive managerial ownership. However one difference stands out, which is correlation with size of the fund. In sample of all funds, correlation between ownership and size is slightly positive but very near zero. On the other hand, in the sample of funds that have positive managerial ownership, correlation with size is somewhat negative. These findings mean that we can not predict the managerial ownership well by looking at the size of the fund even thought Servaes et al. (2006) found that managerial ownership is more usual in smaller funds. Still, if we look only funds with positive managerial ownership, in smaller funds ownership is somewhat higher. Moreover ownership here is measured in euros instead of percentages of fund capital. Thus the correlation difference with smaller and larger funds can not be explained by the fact that it is more difficult to own certain percentage share of larger fund.

As I mentioned, many similarities exist in both models. Firstly, some positive correlation exists between net inflows and managerial ownership. This finding recommends that investors may use the ownership information in their decisions at least in some extent. Thus some investors probably are aware that managers with personal investments in fund perform on average somewhat better, and they increase their investments in this kind of funds. However, relatively low correlation suggests that most investors does not seem to use this ownership information even thought it is nowadays easily available from mutual fund companies. Reason for this may be the fact that ownership of manager is significant explanator for Sharpe ratio only at 10% significance level. Thus the relationship between variables may just be accidental. Nevertheless, it is strange that so few fund companies in Finland require their managers to invest in funds they manage, if this can be used to somewhat boost the net inflows from investors. Yet the net inflows of cash should be the main preference for fund companies, to maximize assets under management and thus maximize also amount of fees raised from management services. Perhaps this ignoring behaviour of management companies toward correlation between net inflows and managerial ownership support the low level of significance.

Secondly, management expenses of the fund do not seem to have almost any correlation with managerial ownership. This is actually natural, because expectably most managers are relieved of management fees and load-fees of funds under their management. Thus the level of fees, which should be one of the major factors for ordinary investor while choosing the fund, plays

no role for manager who is considering to invest in fund under his or her personal management.

Thirdly, stock funds correlate positively with managerial ownership and bond funds negatively. This finding actually came up already in descriptive statistics of chapter 4. However, even thought average ownership is higher among stock fund managers, they have investments in funds they manage more seldom than managers of other funds. Actually this can be reasonable. One could expect stock fund managers to be reluctant to invest their personal money to the funds under their management. This is because the managers of mutual funds have already "invested" their intellectual capital into these funds while managing them. If they also invest their personal wealth into the same funds, they carry extremely high risk, because badly performing manager could then lose his or her job as well as big amount of personal wealth invested in this badly performing fund. The higher risk involved explains why managers of stock funds invest more rarely on their own funds than managers of bond funds, but it may also explain why quite few managers invest in their own funds in the first place.

Considering further, fund managers have tax based motivator to invest in funds under their management rather than directly to stocks or bonds. When their savings are in mutual fund, asset allocation can be changed inside the fund as often they want with insignificantly low expenses and without sales profit tax. Namely sales profit tax does not need to be paid earlier than manager draws his or her money out of the fund. Moreover, as fund managers, they can quite freely choose where to invest assets under their management. From this perspective, through fund under own management is the most convenient way to invest for fund manager. However, investment policy of the fund may restrict the fund manager also in this case. For example, if fund is marketed as emerging market stock fund, fund manager obviously can not invest some of the assets to safe government bonds. Thus investment policy may create the fund too risky or too cautious compared to manager's personal preferences. From this perspective, managers that are managing mixed funds, including both stocks and bonds, have the widest range of opportunities.

Discussion above also supports my views why managers with personal ownership in funds they manage perform better. Manager, who knows that he or she is not running the fund well, surely will not invest to this fund. This reaction is strong especially when risk of dismissal is high. Similarly, manager who knows that he or she is talented investor wants to keep money in

the fund under management. However, this argument would fight against the theory of efficient markets, because managers should not be able to expect in advance whether they will perform well compared to others in the future. Whether the markets are efficient or not, is another question. If markets would be efficient, all the analysis and attempts to beat the markets by fund managers would be useless. I would not expect the whole industry to exist in vain. Moreover, as I mentioned earlier, some "star" managers as Peter Lynch have been able to beat the markets continuously for year after year. Nevertheless, most actively managed funds lose the passive benchmark (e.g. Jensen, 1968). Thus we can conclude that even some managers have special stock picking skills, those managers are relatively rare.

Looking at the ownership stakes of managers with highest Sharpe ratios, they seem to have clearly higher ownership stakes than managers on average, but they are still not the ones with highest ownership stakes, no matter whether ownership is measured with percentages or euros. Thus the situation is quite similar that it was when I compared Sharpe ratios of managers in different earned income levels. In contrary, most managers with highest ownership stakes perform only slightly better than average fund manager. Reasons for these findings could be straight forward. Managers that are doing good job are obviously willing to invest in fund under their management. Then again, those managers that have highest amounts of investments in funds under their management are, according their ownership amounts, particularly wealthy. Hence I believe them to have a lot of investments diversified in many securities and naturally also in funds under their personal management. On the other hand, it is much harder to explain how some of these averagely performing managers have been able to gather huge fortunes. Reasons for these can be most likely found outside mutual fund markets and wealth fund management business. Perhaps they have been successful in some other businesses or they have received vast amounts of money as inherit.

In his study, Servaes et al. (2006) also found that managers with multiple funds have more personal investments in the funds they manage. To see whether this is the case in Finland, I built the Table 13. From this table one can see the average ownership stakes and also some additional information according the number of funds under a manager. Earned income is measured in median, because otherwise few extremes would have skewed the results too heavily, especially in groups of only few managers. Still, ownerships are measured in averages, because median ownership in most groups would have been zero which is not very informative. I limited this contemplation to managers that have 1 to 3 funds under their

management, because managers with more funds are rare. Thus results of managers with 4 to 6 funds would not have been very reliable. Stock funds and other funds are represented separately, because ownership stakes among stock funds are substantially higher.

Table 13. Managerial data according number of funds under management
This table documents Sharpe ratios, median salaries and average ownerships for fund managers according the number of funds they manage. The results are represented individually for both stock funds as well as other funds. Managerial ownership digits are measured in euros and as lagged from years 2004 to 2006. Salaries (earned income) digits are measured from the same period. Control variables and Sharpe ratios are measured from years 2004 to 2007. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy and Veropörssi magazines of Satamedia Oy.

	No.of obs.	No. of funds	Sharpe	Median salary	Avg. ownership
	261	1	0.98	87 800	6 332
Stock funds	27	2	1.13	86 300	35 432
	41	3	0.79	83 900	42 022
	205	1	0.74	79 900	1 043
Other	17	2	0.93	68 600	2 547
	36	3	0.87	74 000	6 590

The table states that managers with multiple funds have more personal investments in the funds they manage also in Finnish mutual fund markets. Average ownership is lowest for managers with only one fund and it is increasing together with number of funds in both stock fund and other fund categories. Most surprising thing in table above for me is the decreasing median salary among stock funds when we move from 1 to 3 funds. Situation is almost similar among other funds. Thus it seems that salary and ownership may correlate negatively. At first thought, this feels illogical. Nevertheless personal ownership can be seen as incentive for manager, hence perhaps there is no heavy pressure to motivate manager by increasing the salary when his or her ownership in the fund is high. More valid explanation for this could be the privately owned fund companies in which managers have large personal ownership stakes in funds under management and they may prefer to draw salaries in form of capital income instead of earned income. In addition I found that managers managing funds distributed by banks have less money invested in their funds. This finding could support my latter argument. However, managers managing bank distributed funds also earn less. Average earned income for fund manager in banks' fund 90 000 € whereas average for manager in non-bank fund is around 122 000 €.

One of the research problems in this study was the relationship between net inflows and managerial ownership. To find some additional support for the significance of this relationship, I tested it with regression shown in Equation 6. Output of this regression is shown in Table 14.

Table 14. OLS Regression results: contribution of managerial ownership to net inflows
This table documents the OLS regression results where net inflows are dependent variable. Managerial ownership digits are measured as lagged from years 2003 to 2006. Control variables are measured from years 2004 to 2007. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

OLS Regression results: contribution of managerial ownership to net inflows

N = 276	Model (i)	Model (ii)
Manager's ownership	1.723 (0.140)	2.032 (0.159)
Sharpe ratio	4.253*** (0.003)	4.086*** (0.005)
Size	0.002* (0.056)	0.008* (0.079)
Overall expenses	2.762 (0.259)	-0.041 (0.705)
Bank (dummy)	7.444*** (0.008)	7.554*** (0.007)
Stock fund (dummy)	-6.290** (0.013)	
Bond fund (dummy)	9.644 (0.499)	
Year 3 (dummy)	-9.114** (0.040)	-9.030* (0.055)
Year 4 (dummy)	-2.334 (0.480)	-2.036 (0.368)
Year 5 (dummy)	-8.069** (0.028)	-9.409** (0.033)
Adjusted R Square	0.106	0.086

As the regression output reveals, relationship between net inflows is not significant even in 10% significance level. However, it may be wrong to say that the relationship does not exist. Strong coefficient for managerial ownership and p-value of 0.140 – 0.159 in above models

would suggest weak correlation to exist. Thus we could conclude that managerial ownership can increase net inflows and interest among fund investors at least a bit. This states that some investors follow managerial ownership stakes and they use this information to achieve better than average investment decisions.

At the end of this part, let us take another look at the hypotheses related to managerial ownership:

H2: Mutual funds with high fund managerial ownership perform on average better

H3: Mutual funds with higher managerial ownership experience in average higher net inflows of cash

As discussion in this section states, both of these hypotheses seem to hold at least in some extent in Finnish mutual fund markets even thought the evidence is not very strong.

6.3. Contribution of gender

I tested the relationship between mutual fund performance and gender of fund manager by using regression model shown in methodology chapter as Equation 4. This regression is again very similar to the one that I used in earlier tests in this study. The crucial difference is that independent variables, lagged earned income and lagged capital income, or managerial ownership, are now replaced with dummy variable separating male and female managers. There is also again one more dummy variable to separate sample years from each other. This is because data for this gender study was available from five years period, 2003 to 2007.

Once again I used the equation with and without stock fund and bond fund dummies, because their unknown effects. In Equations 2 and 3 mentioned dummies were not important explanatory factors for Sharpe ratio, but still they may play some role in Equation 4. This is because time period is longer and some independent variables are changed. Moreover number of funds is somewhat bigger than in Equation 3, because I had to drop outsourced managers outside the sample while measuring the ownership stakes of managers. Table 15 summarizes the output of regression.

Table 15. OLS Regression results: contribution of Gender to Sharpe's Ratio
This table documents the OLS regression results where fund performance (measured by Sharpe's ratio) is dependent variable. Gender digits and control variables are measured from years 2003 to 2007. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

N = 313	Model (i)	Model (ii)
Gender	0.127	0.131
	(0.209)	(0.197)
Net inflows	0.134**	0.128**
	(0.013)	(0.017)
Size	0.001	0.002**
	(0.116)	(0.049)
Overall expenses	-0.272**	-0.305**
	(0.030)	(0.031)
Stock fund (dummy)	0.055	
	(0.476)	
Bond fund (dummy)	-0.068	
	(0.499)	
Year 2 (dummy)	0.510***	0.508***
	(0.000)	(0.000)
Year 3 (dummy)	1.133***	1.131***
	(0.000)	(0.000)
Year 4 (dummy)	0.272***	0.270***
	(0.005)	(0.005)
Year 5 (dummy)	-0.791***	-0.794***
	(0.000)	(0.000)
Adjusted R Square	0.294	0.295

Regression results in Table 15 state that performance of fund in Finnish markets can not be explained by the gender of fund manager in any significance level. Thus male and female managers perform on average equally in risk adjusted terms. This finding is consistent with most of the earlier studies carried out in U.S. markets (e.g. Atkinson et al., 2003). Moreover this finding is reasonable, because it would be irrational for fund management companies to hire both males and females if performance could be boosted by choosing the gender of manager. This would also mean markets to be very inefficient if another gender group could have an ability to perform better systematically. Only possible explanation, why there should be performance difference between genders, is trading volumes. Active trading increases costs

and should lead on average weaker performance. According Barber and Odean (2001), male fund manager trade more and for this reason they should perform worse than their female counterparts. Still, significant underperformance of male managers does not seem to exist in Finnish markets and there is not even evidence that Finnish male managers trade more than Finnish female managers in this case.

To further study differences between male and female fund managers, I constructed Table 16. The table represents how control variables in Equation 4 correlate with gender.

Table 16. Correlations between gender and other variables
This table documents the correlation of gender with other independent variables and dependent variable Sharpe ratio. Gender digits and control variables are measured from years 2003 to 2007. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

Sharpe ratio	0.027
Net inflows	0.028
Size	0.053
Overall expenses	0.042
Stock fund (dummy)	0.043
Bond fund (dummy)	-0.010

Table 16 obviously shows that correlation of any control variable is very weak with gender dummy. Actually, this is exactly how it should be. As seen earlier in this section, there is no significant difference in performance of males and females. Thus also other characters of the funds should be very close to similar in male and female managed funds. Still, especially interesting point here to notice is that even net inflows do not correlate negatively with female managers. The correlation is even slightly positive. This would suggest that investors in Finland do not disdain female managers as their American counterparts (e.g. Atkinson et al., 2003). To find some more evidence for this, I tested relationship between net inflows and gender by using Equation 7. Following table represents the output.

Table 17. OLS Regression results: contribution of gender to net inflows

This table documents the OLS regression results where net inflows are dependent variable. Gender digits and control variables are measured from years 2003 to 2007. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

N = 313	Model (i)	Model (ii)
Gender	3.330	2.872
	(0.527)	(0.587)
Sharpe ratio	4.275***	4.149***
	(0.004)	(0.005)
Size	0.012*	0.015**
	(0.054)	(0.012)
Overall expenses	2.746	-0.541
	(0.239)	(0.777)
Bank (dummy)	15.819***	15.868***
	(0.000)	(0.000)
Stock fund (dummy)	-9.258**	
	(0.021)	
Bond fund (dummy)	3.328	
	(0.522)	
Year 2 (dummy)	-5.246	-4.931
	(0.312)	(0.343)
Year 3 (dummy)	-11.344**	-11.034**
	(0.035)	(0.041)
Year 4 (dummy)	-5.789	-5.583
	(0.248)	(0.267)
Year 5 (dummy)	-12.992**	-12.854**
	(0.012)	(0.013)
Adjusted R Square	0.096	0.031

Table above strongly support the argument that disdaining behaviour toward female fund managers do not exist among Finnish fund investors. Moreover coefficient of female managers is clearly positive in both models (i and ii). This means that female managed funds have even received somewhat bigger net inflows on average. However the difference in net inflows is not significant in any level. Perhaps this finding is due the high level of equality between genders in Finland as I showed in Introduction chapter.

Despite of insignificancy, one can not perfectly pass the fact that females have somewhat higher net inflows according the table above. Reasons for this could be hard to find in practice.

Perhaps one possible reason could be the general supportive attitude among females. For example, I know some women who always want to vote another woman in parliament elections. It is hence possible that some female investors act like this and are willing to put their money only under female fund manager. However, there is no theoretical ground for this argument. In addition, I believe that only few investors are even aware of the fund manager's gender when they invest in a mutual fund. Another possible reason for slightly higher net inflows could be the slightly higher performance. If we look at the Table 15 more carefully, females have weak positive correlation with performance even thought it is too weak to make any conclusions. Still, it feels rational that slightly higher performance is associated with slightly higher net inflows in this case, because relationship between performance and inflows has been strongly testified (Sirri and Tufano, 1998). Then again, reason for slightly higher performance of female managers could be higher affirmations for females to get a job from fund management sector which is men dominated (Kim, 1997). Thus higher affirmations could mean that those females that managed to become fund managers are on average more talented. Perhaps this argument could explain as well the higher number of funds per manager among females. However, there is no evidence for such female disdaining behaviour by fund management companies. Moreover this study was purposed to concentrate on possible disdaining behaviour of investors.

At the end of this part, let's take another look at the hypotheses related to gender:

H4: There is no difference between the performance of male and female fund managers

H5: The net inflows of cash to female managed funds are lower than net inflows to male managed funds

As discussion in this section states, hypothesis four seems to hold. Regression results show that female managers have performed a bit better on average, but the difference is so weak that it is not significant in any level. Thus there is not enough evidence for this and we can conclude males and females to perform equally. Considering the hypothesis five, we need to reject it. Discussion and test results strongly propose that female managers are not disdained among investors in Finland.

6.4. Other findings

This section covers other interesting findings related to this study, which are not the actual research problems. Section is divided to two parts. First I go through the results of volatility regressions represented in Methodology chapter. Then, I represent other findings, mostly related to control variables used in regression models.

6.4.1. Results of volatility regressions

To get the most out of the unique data I have gathered for this study, I wanted to continue studying Finnish fund managers beyond actual research problems. For this reason I constructed volatility regression models represented in Methodology chapter as Equations 8, 9 and 10. These models allow me to become familiar with possible differences in risk taking behaviour that can be related to salary level, personal ownership or gender of fund manager.

Let us start by relationship between volatility and salary. Regression results showed directly that there does not seem to be any relationship between volatility and managerial income. This means that level of salary does not affect manager's risk taking behaviour. Some studies from U.S. (e.g. Brown et al., 2001) suggest that the worst managers avoid risk taking to prevent the dismissal and that average managers take most risk to achieve the reputation of star manager. However, as I divided funds to deciles according Sharpe ratio, average volatility was very similar in every decile. Thus it seems that findings of Brown et al. (2001) do not hold in Finnish mutual fund market. Moreover we should keep in mind that high performance does not necessarily mean high salary among fund managers as results of section 6.1. state.

Next, we can take a look at the regression results of Equation 9. This output should reveal if there exists relationship between volatility and managerial ownership. The output is represented in Table 18.

Table 18. OLS regression results: contribution of managerial ownership to volatility
This table documents the OLS regression results where volatility is dependent variable. Managerial ownership digits are measured as lagged from years 2003 to 2006. Control variables are measured from years 2004 to 2007. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

N = 276	**Model (i)**
Manager's ownership	-0.353*
	(0.069)
Size	-0.003
	(0.173)
Net inflows	0.001
	(0.429)
Overall expenses	1.151***
	(0.000)
Bank (dummy)	0.240
	(0.238)
Stock fund (dummy)	4.896***
	(0.000)
Bond fund (dummy)	-5.159***
	(0.000)
Year 3 (dummy)	-5.423***
	(0.000)
Year 4 (dummy)	-3.305***
	(0.001)
Year 5 (dummy)	-1.959***
	(0.000)
Adjusted R Square	0.181

As the results state, there is some negative correlation between volatility and managerial ownership. The correlation is not very strong but still clearly significant at 10% level. This is interesting finding, because it means that managers try to prevent at least some of the risks when they have their personal wealth in the fund. Perhaps one reason could be that those managers have "all eggs in one basket", meaning that both the persistence of their jobs and their personal wealth depends on the performance of the fund. Thus they want this fund to be less risky. Whether this is good thing for investor, depends on the objectives of fund investing. If investor is looking for maximal return and is able to carry high risks, managerial ownership could possible be negative feature under these results. On the other hand, most investors are looking for reasonable risk-return relationship, and for this funds with managerial ownership

are on average good choices. In those funds investors can at least trust that fund managers is doing all he or she can for a great performance, because the manager have also personal investments on stake. Moreover, as results state in section 6.2., funds associated with managerial ownership perform on average somewhat better.

Finally, we can take a look at the regression results of Equation 10. This regression reveals the possible correlation between volatility and gender. Output of mentioned test is shown in Table 19.

Table 19. OLS Regression results: contribution of gender to volatility
This table documents the OLS regression results where volatility is dependent variable. Gender digits and control variables are measured from years 2003 to 2007. The numbers in parenthesis are p-values. The asterics indicate significance levels. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. The raw data is gathered from mutual fund reports of Sijoitustutkimus Oy.

N = 313	**Model (i)**
Gender	-0.964**
	(0.012)
Size	-0.001
	(0.141)
Net inflows	0.000
	(0.926)
Overall expenses	1.035***
	(0.000)
Bank (dummy)	0.143
	(0.223)
Stock fund (dummy)	6.767***
	(0.000)
Bond fund (dummy)	-5.125***
	(0.000)
Year 2 (dummy)	-4.568***
	(0.000)
Year 3 (dummy)	-5.828***
	(0.000)
Year 4 (dummy)	-3.321***
	(0.000)
Year 5 (dummy)	-2.055***
	(0.000)
Adjusted R Square	0.219

Table above shows that female managed funds have on average lower volatility, meaning that female managers carry less risk than male managers. Moreover difference is statistically very significant. Finding is in line with U.S. studies (e.g. Powell and Ansic, 1997). According these results females do not only carry less risk, but also achieve lower returns, because on risk-adjusted basis males and females perform almost equally. However, it is harder to explain this finding. At least I am very sceptic about the arguments that females are more conservative risk takers by nature. One possible causal for such results could be females' possible concentration to manage bond funds, which are naturally low-risk funds. As the Table 4 in Chapter 4 reveals, percentage of female managers is indeed extremely high among short-term bond funds, which is the fund category associated with lowest risks and returns. In 2006 even more than half of short-term bond funds were under female management. On the other hand, emerging market stock funds, which could be considered as fund class associated with highest risks, are strongly male dominated. Whether these are sufficient explanations for lower risks and returns of female managers it is unclear. Anyway there are also a lot of female managers in international stock funds, which are not low risk funds.

6.4.2. Findings related to control variables

In this section, I go through the findings that we can draw from control variables of regression results of all accomplished tests. We can start by looking at the performance regressions (Tables 7, 8, 11, 12 and 16). From mentioned tables, two significant relationships stand out: Net inflows correlate positively with performance and overall fees correlate negatively with performance. These correlations show pretty similarly in all five performance regression outputs. In addition, these results were quite expectable, because they are in line with earlier studies, even thought correlation net inflows and performance has been recognised to be weaker in Finland than in U.S. (Knuutila et al., 2006; Korkeamäki and Smythe, 2004). Considering the relationship between net inflows and performance further, it states that investors believe in funds that have performed well in the past even thought there is no proof that these funds are successful also in the future. Blake and Morey (2000) studied the persistence of mutual fund performance in U.S. markets and found that even funds with best past performance, perform only slightly better than average in the future. Nevertheless, this kind of investor behaviour is supportive toward managers. When managers know that net inflows depend on their performance, they surely give effort for good performance, because

high net inflows are their ultimate goal. Thinking again the negative correlation between performance and fees, it is supported by theory as explained earlier. After high fees there is less net returns for investor even thought gross return would be equal.

In contribution of salary section, I mentioned there to be minor differences in control variables if index funds are left out. These differences relate to overall fees and net inflows. Firstly, overall fees do not correlate negatively with performance as significantly any more. I think explanation for this is simple. Index funds on average are one of the cheapest funds and they outperform most other funds (e.g. Bogle, 1999). Thus negative correlation between fees and performance is very strong in these funds. When they are left outside the sample, this negative correlation weakens. Secondly, net inflows do not correlate positively with performance as significantly as before. This could give as a hint that index funds have achieved higher net inflows during the recent years. Index funds are performing well compared other funds and their inflows must be over average, because the correlation between performance and inflows has weakened when these are left outside the sample. The finding states that more and more investors have realized the rationality of index funds and increased their investments in these funds instead of actively managed funds.

Correlation between performance and size is not as obvious. Tables 7 and 8 have weak negative correlations, whereas Tables 11, 12 and 16 show positive correlation. Putting these results together, perhaps we could conclude to very weak positive correlation. Nevertheless, it seems that fund size is relatively bad control variables, and its power to explain dependent variable in this case is not very significant. In theory, there are both upsides and downsides related to increase in fund size. Upside for bigger size is naturally economies of scale, because some expenses remain relatively stable also in fund management business despite of fund size. The salary of fund manager is good example of this. Then again, downside is hardship to change the asset allocation of fund quickly without affecting to market price, especially if the fund is investing to a field of multiple illiquid companies (Chen et al., 2004). According results of this study, it seems that economies of scale are slightly dominating in Finnish markets and they can more than offset the problems of rigid asset allocation.

Considering then the stock and bond fund dummies, stock funds seem to correlate positively with performance and bond funds negatively. This means that even in risk adjusted basis, stock funds perform better than bond funds. Mixed stock and bond funds are somewhere in the

middle. However, these correlations are not significant at any level. Moreover adding these dummies to Equations 2, 3 and 4 seems to decrease adjusted R square and thus the explanatory power. Another problem related to these dummies is that they correlate heavily with each other that cause serial correlation. For these reasons, I prefer to use mentioned equations without stock and bond fund dummies.

Next I discuss about the findings related to control variables of net inflow equations. Tables 14 and 17 reveal these results. Also from these tables, two significant relationships stand out: Positive correlation between inflows and Sharpe ratio and positive correlation between inflows and bank dummy (purposed to separate bank and non-bank distributors). Moreover these correlations are very significant, in some models even in 1% level. Actually, both of these were easily expected. As I have already mentioned, well performing funds have higher net inflows and this is also supported by previous studies in Finland (Knuutila et al., 2006; Korkeamäki and Smythe, 2004). On the other, there is also earlier evidence about the bank dominance from Finnish mutual fund markets. In their study, Korpela and Puttonen (2005) recognized bank managed funds to gather most of the new mutual fund investments, even thought their funds are expensive and somewhat worse performers. Now after few years, situation seems to be similar and banks are still receiving most of the inflowing cash. Reasons for this are probably the wide and efficient distribution channel through branch networks and well known and trusted brand names. Also Korpela and Puttonen (2005) concluded to these reasons.

Considering then the correlations between inflows and other control variables, results are more surprising. Firstly, correlation between fees and inflows changes from positive to negative from model to another and these relationships are not significant in any level. Thus we can conclude that there is no relationship and investors do not seem to give too much attention for fees while choosing the fund. This is irrational, because fees are the only easily expectable factor affecting the investor returns and it should be one of the most important guideline supporting investor's decision making. Secondly, there seems to be some evidence that bigger funds receive higher net inflows even thought the coefficient is very small. This is the situation even I ended up measuring net inflows as percentage of fund size. In the beginning I tested models with euro amounted net inflows and in this case the correlation between net inflows and fund size was so significant that other factors became futile. Thus it is obvious that bigger funds have bigger net inflows measured in euros, but I was surprised that big funds

grow more even in percentage terms. Third surprise for me was the significantly negative correlation between net inflows and stock fund dummy. This means that stock funds have been receiving far less new investments during my sample period than bond or mix funds have. Perhaps this reflects that most fund investors are very risk-averse, which is naturally reasonable if investment horizon is very short. However, I believe many investors to keep their money in funds for long-term. In addition, during my sample period economy was booming when also stock prices usually go up. Thus investors that kept their money in bond funds lost the high returns that stock funds were able to serve. This kind of finding was interesting also because Wermers (2000) found that fund investors in United States are weighting continuously larger stakes of their fund investments to stock funds. In this case, it seems that U.S. investors are not as risk-averse as their Finnish counterparts. From Tables 14 and 17 one can also recognise positive correlation between net inflows and bond funds even thought it is not statistically significant. From this perspective it seems that inflows to bond funds are only slightly higher than inflows to mix funds.

Finally, we can take a look at the control variables of volatility regressions. These results can be found from Tables 18 and 19. This time, there are many strongly significant relationships. Overall expenses and stock fund dummy correlate positively with volatility, whereas bond fund dummy correlates negatively with volatility. All these correlations are significant even at 1% level. Thinking about mentioned correlations, only real surprise is the correlation between overall expenses and volatility. This finding means that more expensive funds seems to try to cover the costs and reach same returns for investors after management expenses by taking additional risk compared to cheaper funds. This is naturally bad from investor's perspective, because in these cases he or she is carrying more risk than necessary to receive the rate of return. Actually this finding is closely related to weaker Sharpe ratios of expensive funds. If Sharpe ratio is weaker, returns must be lower or volatility higher. Thus it seems that In Finnish mutual funds markets expensive funds choose to take more risk and try to achieve similar returns with cheaper funds. Of course relationship between volatility and fees could be explained with the fact that stock funds are more risky and usually more expensive as well. However, we can line this possibility out, because I have fund-class dummies in the models. This is also the reason, why fund-class dummies are inevitable in this model. As I mentioned other correlations were easy to expect. Stock funds are much more risk on average than stock funds or mix funds. For bond funds situation is of course contrary.

Other control variables in volatility regressions did not have significant relationships. Net inflows and fund size had moreover coefficients very close to zero, which means that they have no relationship with risk. Bank fund dummy showed weak and relatively insignificant relationship with volatility. This relationship is negative meaning that bank managed funds are a bit riskier. Bank dummy is quite bad explanator for volatility and it is dominated by other independent variables. Nevertheless, one can conclude that banks managed funds are on average not riskier than non-bank managed funds. Then again, banks have weaker Sharpe ratios as seen earlier, meaning that their returns must be weaker when volatility is relatively constant between banks and non-banks.

6.4.3. Managerial turnover and dismissals

In this section, I wanted to take a quick look how often mutual fund managers are changed, how managers behave when the threat of dismissal is high and what happens for dismissed managers in Finnish markets. According previous studies (e.g. Chevalier and Ellison,1999), there are two major factors that affect the probability of dismissal. Firstly, managers that have negative returns in their funds, have substantially higher probability of dismissal than other managers. This is the most obvious reason why the worst managers want to avoid taking risks. Thus they are primarily concerned about whether their return is over zero, not whether their performance compared to benchmark is good. This kind of behaviour is naturally harmful for investor. Secondly, younger managers have higher risk of dismissal, especially if their unsystematic risk deviates considerably from the mean of the fund's objective group. This leads to the fact that young managers are discouraged to use their personal intuition and stimulated to herd from other, more experienced managers.

To get better understanding, how usual changing fund manager in Finnish markets is, I calculated number of funds that have changed manager during each year. Results state that 40 to 50 funds have changed manager during each year in my sample. This amount sounds relatively high for me. However, most of these managers changed to another fund or had still one or more fund to manage after giving up one fund. Thus it seems that majority of managerial turnover in fund management business is natural shifting to another fund to achieve higher salaries or new challenges. In this case it is still hard to ensure whether the manager has been dismissed and been able to find a job from another fund company or

changed to another fund voluntarily. At least when manager have changed to another fund inside the same company, the manager has not been dismissed. When manager have changed from company to another, it is unclear whether he or she has been dismissed or not. If we then look at the managers that have quitted in one fund and have not continued in any other fund, their percentage share of all managers varies 3% to 4% during the sample period. We can conclude at least many of these managers to be dismissed, because as far I was able to find out most of them are not even near the retirement age. Surely some of these managers have changed to manage pension funds which mean that they are not dismissed. This problem leads to the fact that I am not able to accurately calculate the number of dismissed managers. Nevertheless, disappearance of 3% to 4% of managers annually from the sample sounds very high, because markets have been booming under the period under review. Thus during bearish markets expectably even more managers are dismissed.

Considering these dismissed managers further, they seemed to have weaker Sharpe ratios and also quite often negative returns. This finding is pretty much similar with the study of Chevalier and Ellison (1999). Nevertheless, it seems that Finnish fund management companies punish their managers primarily according bad performance compared to benchmark, whereas in U.S. they are often punished purely because of negative returns. Evaluating managers according benchmark as Finnish distributors do is obviously more reasonable. On the other hand, if investors are concerned about negative nominal returns, it may be reasonable for the management company to change managers according this factor. Chevalier and Ellison (1999) found weak evidence that net inflows increase in funds that change the manager. This seems to be case also in Finnish markets even thought sample of dismissed managers is too small to measure significances.

Finding that clearly separates from U.S., is the age of dismissed managers. Dismissed managers in Finland were mostly relatively old fund managers, at least as far I was able to found out their ages. Hence fund companies could be more tolerant towards their young managers and give them another chance after bad year. In principle, one could expect this to be good policy. If young managers do not have to be as much afraid of dismissal as their American counterparts, they most likely try to use their own intuition while making investment decisions.

Because my study concentrates on managerial ownerships stakes and salaries, I checked the salaries and ownerships of dismissed managers. To my surprise, most of the dismissed managers had higher than median salary. Maybe this is also another proof that salaries do not have much to do with performance in fund management industry. Anyway, two possible explanations for this came to my mind. Firstly, it is reasonable to expect more experienced managers to have higher salaries and as I found out, most of the dismissed managers are quite experienced. Thus it is possible that these dismissed managers are not highly paid compared to managers with same experience. Secondly, even thought salaries do not correlate with performance, fund companies may still expect better performance from the managers that have high salary. For this reason, managers with higher salary might more often underperform compared the expectations of fund company, and lose their job. Thinking about the ownership stakes of dismissed managers, they seemed to be lower than ownerships stakes of managers on average. This was pretty expectable. As I found out in section 6.3., performance correlates with managerial ownership. Managers that are dismissed have performed worse, thus it is not surprise that also ownership stakes are lower in those funds. Still, I believe there to be also another reason for this finding. In fact, threshold to dismiss a manager with large personal ownership in fund under management may be higher. If manager got dismissed, he or she surely draws the money out of the fund which is bad hint for the investors.

7. Conclusions

This Master's Thesis intends to study characteristics of Finnish mutual fund managers and how these characteristics affect risk-adjusted performance of funds. Especially I concentrated to study influence of manager's salary, personal ownership and gender to performance. This is interesting field to study, because there is no earlier research from Finnish markets. Moreover my research concerning relationship between manager's salary and performance is first of a kind in the world to my best knowledge. Major reason for this is the hardness to gather income data of private persons, which is not public in most countries. In addition I studied factors that can be used to explain net inflows and volatility of funds. This way, I was able to see what factors investors value while choosing the funds to invest their wealth as well as managerial or fund characteristics that could explain the risk. To gather the results, I tested 9 separate regression models.

To summarize the major results, there do not seem to be evidence that future performance could be estimated neither with manager's income nor gender. However, there is some evidence that managers with personal investments in the funds they manage perform better. Thus personal ownership can be used as one factor while choosing mutual funds to invest. Moreover net inflows are higher in funds associated with managerial ownership which suggests that investors prefer these funds at least in some extent. There is similar evidence also from U.S. markets. Considering female managed funds in Finland, their net inflows are not lower than in male managed funds. We can conclude that disdaining behaviour towards female managers does not exist among Finnish investors even thought it exists in United States according few studies.

In addition to mentioned results, I made many interesting co-findings in this thesis. Firstly I studied explanatory variables for volatility. I found that female managers and managers with personal ownership in the funds they manage have lower volatilities. It is hard to explain why female managers invest more conservatively even thought there are similar findings outside the Finnish markets. Considering lower volatility of funds with managerial ownership, reason could be that these managers have "all eggs in one basket", meaning that both the persistence of their jobs and their personal wealth depends on the performance of the fund. Thus they want this fund to be less risky. Secondly, I found that Finnish mutual fund companies dismiss managers with somewhat different arguments than their American counterparts. Basically, Finnish companies punish their managers according bad risk-adjusted performance compared the benchmarks, not according negative returns as many American fund companies. Moreover Finnish fund companies seem to usually give another chance for young fund managers even thought they have had a bad year. Thirdly, Finnish investors seem to be more risk-averse than Americans. Moreover they do not seem to give attention for fees while choosing the fund to invest. Fourthly, bigger funds are growing more even in percentage terms. This means that Finnish mutual fund markets have got more and more dominated by few major players even thought competition and number of fund distributors have continuously increased. Finally, overall fees have strong positive correlation with manager's earned income. This means that manager's salary could be one major cost driver for mutual funds.

Mutual fund research is still relatively scarce in Finland. Thus I think it would be important to study this area further while mutual funds are increasing their importance as investment vehicle. Future research related to my thesis could consist of other fund managerial

characteristics that may affect the performance. Such characteristics could be for example manager's educational level, age, experience as fund manager or former work experience before becoming a fund manager. Studies related to some of these characteristics already exist in U.S. Another interesting future research could be to accomplish my study with longer time horizon after few years. This way the results would be more reliable and it would be possible to see whether the results are similar also during bearish market situation. However, in future it may be very difficult to gather income data of managers, because that is not expectably public information after this year. Hence research should possibly be more targeted to ownership or gender questions.

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Appendices

APPENDIX 1.

Number of mutual funds registered in Finland for each distributor	
3C	3
Aktia	11
Alfred Berg	10
Altos	1
Arcos	1
Avenir	1
Carnegie	10
Celeris	4
Danske Bank	4
Eliksir	1
Elite	1
eQ	11
Evli	23
Fides	11
FIM	19
Fondita	3
SEB (incl.Gyllenberg)	17
Handelsbanken	6
Ice Capital	9
Nordea	44
Osuuspankki	37
Pohjola	28
Sampo (incl. Mandatum)	46
Seligson	15
Sääästöpankki	6
Tapiola	15
Ålandsbanken	7